

THE IMPACT OF THE FREQUENCY OF ACCOUNTING-BASED
PERFORMANCE REPORTS ON
CAPITAL BUDGETING DECISIONS

BY

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I dedicate this dissertation to my parents, Hayman and Joan Kite.

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By

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Performance evaluation research has identified dysfunctional consequences of using accounting-based performance measures. Some critics have attributed American corporations' lack of competitiveness to the short-term emphasis in financial statements. The purpose of this study was to examine the effect of the frequency of performance evaluation, using accounting-based performance measures, on the capital investment decision process.

Based on self-presentation theory and the sunk cost phenomenon, hypotheses were developed concerning the effect of the frequency of performance evaluation upon an individual's self-presentation motivation. The major hypothesis was that the frequency of performance evaluation would influence the perceived personal benefits associated with escalating an investment commitment. Furthermore, the perception of these benefits, as well as the perception of benefits to the organization from escalating and benefits from switching to the alternative investment, were predicted to affect the capital investment decision positively.

An experimental study was conducted to investigate the differential effects of long-term and short-term performance evaluation. To disguise the true purpose of the study, the

capital budgeting decisions were made in the context of a business simulation, using an in-basket scenario. The study was conducted over four periods during which subjects made capital budgeting choices for a hypothetical company. The treatments differed only as to when their performance was evaluated (short-term or long-term). Using self-reports as data, the perceptions underlying the capital budgeting decisions of each subject were determined. The length of commitment to the original investment decision was also measured.

The results provided weak support for the effect of the frequency of performance evaluation on the individuals' perceptions of the personal benefits from escalating commitment to the original investment. These results were stronger when the extraneous variability associated with risk aversion or ethical considerations was removed.

CHAPTER 1 INTRODUCTION AND BACKGROUND

Introduction

Throughout its development, what accounting has measured has channeled the efforts of the participants whose behavior was being measured. For example, early cost accounting focused on conversion costs, and this caused factory owners to concentrate on cost reduction through new forms of power and mechanization. Since accounting measures can direct organizational activities, accounting research should consider the way "in which a particular account can shape, mould, and even play a role in constructing the setting of which it forms a part" [Hopwood 1983, p. 288].

Research on the use of accounting-based measures in performance evaluation has examined contextual, economic, and psychological variables that are important in explaining attitudes and performance. One stream of research has uncovered some of the dysfunctional consequences of using accounting-based performance measures (ABPM). These consequences, such as rigid bureaucratic behavior and invalid data reporting, occur when managers act to improve their performance scores for specific accounting indices. For example, in a field study observing the behavior of officials in two government agencies, Blau [1955] found that employees acted in ways to affect the performance measure and not the performance itself. Magee and Dickhaut [1978] reported that the choice of compensation plans affected behavior. It appears that ABPM have powerful repercussions within an organization; therefore, managers should be careful to select the accounting-based performance measures that motivate behavior consistent with organizational objectives.

Purpose of the Research

The purpose of this research is to examine the effect of the frequency of performance evaluation, using accounting-based performance measures, on the capital investment decision process. The model presented in the study posits a direct effect of the frequency of ABPM on the cognitive processes underlying the capital budgeting decision. In addition, an indirect effect of personality variables on these processes is predicted.

Environmental, organizational, individual and group variables influence both the method of performance measurement and the effectiveness of the measurement. For example, environmental variables such as task environment and societal values affect the use and usefulness of accounting-based performance measures. In Japan, where managers often are committed to their companies for life, the ABPM used affects behavior differently than in the United States, where employees' tenure with firms may be relatively shorter. The current research holds the effect of environmental, organizational, individual and group variables constant, and investigates the effect of different types of performance evaluation on behavior.

The study poses three major research questions. Does the frequency of performance evaluation affect an individual's perception of the benefits of a decision? Is the relationship between the frequency of performance evaluation and the perceived benefits moderated by variables such as the perceived ability to manipulate one's image to others? Do the perceived benefits weighted most heavily by subjects explain the actions taken?

Motivation for the Research

Performance evaluation research has identified dysfunctional consequences of using ABPM. However, the influence of some fundamental aspects of ABPM has not received the express attention of those interested in explaining individual motivation and behavior in an organizational context. According to the framework developed by Smith [1976],

performance measures may vary with respect to their specificity, to their closeness to organizational goals, and to the time span covered. Accounting research has indirectly investigated both the specificity and the closeness to organizational goals through research using the contingency paradigm and through research on the dysfunctional effects of specific ABPM. Research investigating the effects of time span has only been performed at the organizational level. Time span effects on individual behavior have been given little research attention.

The lack of research on the effect of the time span of ABPM on individual behavior is puzzling, since the ability of ABPM to influence behavior has been established by prior research [Magee and Dickhaut 1978; Chow 1983]. Performance evaluation is used for purposes such as compensation, counseling, training and development, promotion, manpower planning, retention or discharge, and validation of a selection technique [Eichel and Bender 1984]. Regardless of the intended purpose, however, it is inevitable that the method chosen will have motivational implications. The existence of a relationship between performance evaluation and behavior should cause superiors to consider more carefully the ABPM chosen to evaluate subordinates.

This study attempts to expand the limited body of literature in this area by focusing on one basic dimension of evaluation: the frequency of evaluation. It investigates whether the frequency of performance evaluation mitigates one possible dysfunctional consequence of short-term performance evaluation known as management myopia. Management myopia occurs when managers who are responsible for short-term earnings become excessively short-term oriented due to the lack of balancing long-term incentives [Merchant 1989].¹

¹It is possible that other short-term measures within an organization, such as analyst forecasts or external reports, will also cause investment myopia. This study will ignore these influences in order to determine whether one component of an organization's information system, performance evaluation, does influence management myopia. If this can be established, it will provide a basis upon which it may be determined whether other information system characteristics also influence management myopia.

Investment myopia is a type of management myopia which occurs when a business unit must invest for the future but chooses short-term investment strategies because it is evaluated using short-term measures of performance. Therefore, the manager must create and maintain the impression that will result in the best short-term image. These consequences presumably diverge from the behavior desired by the owners.² The sunk cost effect, whereby an individual escalates commitment to an inferior course of action, may be an example of investment myopia. The sunk cost effect stems from what Staw [1980] called "retrospective rationality," i.e., considering previous decisions so as to appear rational. He called the normative, economically rational approach "prospective rationality." The prospectively rational approach ignores sunk costs, processes information regarding future outcomes and chooses the alternative which will attain the highest outcome.

Since the sunk cost effect may be an example of investment myopia and because the act of accounting can influence behavior, it is possible that the choice of ABPM could be used to mitigate a manager's tendency to escalate commitment to a faulty course of action. Therefore, the effect of varying the frequency of performance evaluation on the tendency to escalate commitment is examined. As Ijiri et al. [1970] argued, unless one can demonstrate that different accounting methods in a given context result in different

²Major companies attempt to alleviate this goal incongruence by compensating executives with a combination of compensation packages. For example, at IBM the components of an executive's compensation consist of salary, variable compensation (incentive plans and award plans) and long-term performance programs (e.g., stock option programs) [Edman 1990]. Some companies [e.g., Edman 1990] have attempted to align managers' interests with those of the business by offering long-term incentives such as stock options. This approach is also used by corporations on a broad level for senior managers, thereby tying rewards to long-term performance accounting measures such as a five-year trend in EPS [Merchant 1989]. However, there are two problems with the present approaches. First, there is a question as to the point at which this type of ownership outweighs other personal motivations to maximize utility. Second, the performance evaluation/rewards of lower levels of management are usually not tied directly to project outcomes. Rather, Merchant pointed out, long-term written promises are tied to multi-year profit of the profit center, corporation or organization. Therefore, restructuring the application of ABPM (e.g., time frame of evaluation) is a more direct approach than offering long-term incentives.

decisions, then there is no point in arguing the relative merits of accounting methods. Therefore, in a common setting, the cognitive processes and decisions associated with long-term performance evaluation will be compared to the the cognitive processes and decisions associated with short-term performance evaluation.

This study is the first to offer explicit hypotheses concerning the cognitive processes underlying an individual's reaction to accounting-based performance measures. Furthermore, this study will expand the current body of accounting literature by investigating a previously unexplored relationship between the frequency of evaluation and individual behavior. The availability of a descriptive model for the effects of long-term/short-term performance evaluation could enable managerial accounting systems and reports to be designed to minimize escalation errors and other dysfunctional behaviors resulting from the use of accounting-based performance measures.

Overview of Research Method

The effect of the timing of ABPM on capital budgeting decisions was examined in an experimental study that used 109 student subjects. The experimental task encompassed four periods during which subjects made capital budgeting decisions for a hypothetical company. To disguise the true purpose of the study, the capital budgeting decisions were made in the context of a business simulation, using an in-basket scenario. One half of the subjects received a performance evaluation every period (ST) while the other half received one performance evaluation at the end of the experiment (LT). Written self-reports captured the perceptions underlying the capital budgeting decisions of each subject. The length of commitment to the original investment decision was also measured. Subjects earned tickets based on their performance in the study. The tickets were entered into a lottery which awarded seven cash prizes. This reward scheme was used to motivate student performance during the experiment.

Organization of Remaining Chapters

Chapter 2 discusses prior research relevant to the research questions. The model of the differential effect of the frequency of performance evaluation on the cognitive processes underlying capital budgeting decisions is presented in Chapter 3, along with the research hypotheses. Chapter 4 describes the research design used to test the hypotheses. The results of the experiment are described in Chapter 5. A summary of the study and conclusions are presented in Chapter 6.

CHAPTER 2 REVIEW OF LITERATURE

Introduction

Three bodies of literature are relevant to this study: performance evaluation [e.g., Hopwood 1972, 1974; Hayes 1977], self-presentation [Schlenker 1980], and sunk costs [e.g., Staw 1980]. The performance evaluation literature is reviewed to provide evidence of the contingent nature of the effects of performance evaluation, the possible dysfunctional consequences of using ABPM, and the possible effects of varying the time dimension of ABPM. Since it is posited that individuals' self-presentation motivation will be affected by the frequency of accounting-based performance measures, the self-presentation literature is reviewed next. Finally, since individuals may consider sunk costs in their decisions because they are concerned about the impression they present to others, the sunk cost literature is reviewed in the final part of this section.

Performance Evaluation Literature

Performance evaluation may focus either on the process of performing or on the results of the performance. Most evaluation instruments that measure the process of performing utilize character traits. On the other hand, those evaluation instruments that measure performance outcomes generally employ cost-related variables [see Latham and Wexley 1981]. The studies reviewed below are concerned with the latter approach.

Contingency Theory: Implications for the Design of ABPM

Contingency theories have been applied to many organizational phenomena. Performance evaluation is no exception. Hayes [1977] provided a contingency framework

for analyzing the effects of performance evaluation. He hypothesized that the effectiveness of various measures of organizational performance is dependent upon internal, interdependency, and environmental factors (i.e., that there was no one "best" method of performance evaluation). Internal factors are those defined within the organizational subunit such as nature of the tasks, types of people and the ability to measure and quantify functions. Interdependency factors describe interactions with other subunits such as reciprocal or sequential relationships. Finally, environmental factors refer to such factors as market share, environmental stability, and environmental diversity. Hayes's results supported the contingency framework: ABPM were not effective for all organizational subunits.

A significant body of research on variables that might temper the outcome of performance evaluation has used the contingency paradigm [Brownell 1982; Kida 1984; McNamee 1988]. Contingency variables have been examined for their effects on organizational performance, individual performance, and attitudes. The studies have explored the effects of such contingency variables as evaluation style [Hopwood 1972; Otley 1978], leadership style [Hopwood 1974], task uncertainty [Hirst 1981], environmental uncertainty [Govindarajan 1984], business strategy, incentive bonus systems, and strategic business unit effectiveness [Govindarajan and Gupta 1985].

Behavioral Consequences of ABPM

Research using the contingency paradigm has typically correlated behavior with performance evaluation system characteristics. Rarely has the performance evaluation system been treated as an independent variable with behavior as the dependent variable. The limited research that did treat performance evaluation as the independent variable was based upon the expectation that the choice of ABPM would affect behavior on the dimension measured. These behavioral consequences have been explored at both organizational and individual levels and are discussed next.

Behavioral consequences at the organizational level. Larcker [1983] evaluated the changes in decisions associated with changes in performance evaluation. He posited that the adoption of performance plans would be associated with increased corporate capital investment.¹ His prediction was based upon the idea that since performance plan compensation is based upon a longer time period than the typical short-term plan, managers would lengthen their decision-making horizon. This increased horizon should heighten the attractiveness to managers of projects that exhibit later payoffs. Larcker's predictions were supported. In his study of firms that adopted performance plans and had changes in corporate capital investment, he found that corporate capital investment increased with the adoption of performance plans.

Behavioral consequences at the individual level. In a field study of five industrial companies, Hofstede [1968] found that 'tightness' of job standards affected motivation. Motivation increased as standards became more difficult to achieve, but this levelled off. When standards became too difficult to achieve, motivation began to decrease. Rockness [1977] found similar results for performance and satisfaction. He used a laboratory setting to study the effects of alternative budget levels, reward structures, and performance feedback on subject performance and satisfaction. Higher budget levels resulted in higher performance. Performance and satisfaction were increasing with the number of periods for which the subjects were participating. Magee and Dickhaut [1978] also found evidence that the type of performance evaluation affects behavior. They investigated the effect of performance evaluation on the variance investigation behavior of individuals. They assigned individuals to one of two compensation plans. Compensation plan one (CP1) reduced individuals' compensation for the cost of investigation; compensation plan two

¹Performance plans have the following characteristics: 1) they are long-term (3-6 years); 2) compensation is deferred until a future date and is forfeited if the employee leaves the organization during the compensation period; 3) goals are explicitly stated in growth terms (accounting-based measures) over the award period; and 4) the payoff is bounded by zero from below and increases as performance exceeds the target [Larcker 1983].

(CP2) paid a fixed amount or zero, depending on whether the costs of investigation and of operation were less than a predetermined standard. Magee and Dickhaut found that the groups used different decision rules. Specifically, individuals in CP1 set the upper bound for investigation higher than the mean departmental costs (which were distributed according to a conditional distribution contingent upon the state of nature). On the other hand, those in CP2 showed no preference for setting the upper bound equal to or greater than the mean.

Chow [1983] explored the effect of job standard tightness and compensation scheme type on job performance. He found that tight standards resulted in higher performance than average standards and that piece rate compensation resulted in higher performance than fixed pay or budget-based pay.

Dysfunctional Consequences of ABPM

Agency theory recognizes that the utilities of managers and owners may be divergent. Therefore, contracts must be created to motivate managers to perform as desired by the owners. If the contracts do not provide this motivation, the managers' performance may result in dysfunctional consequences. Ridgway [1956] pointed out that "even where performance measures are instituted purely for purposes of information, they are probably interpreted as definitions of the important aspects of that job or activity and hence have important implications for the motivation of behavior" (p. 247). In other words, even if the performance measures are not tied to compensation, the act of measurement itself can motivate dysfunctional behavior. Thompson and Dalton [1970] stated that comprehensive performance appraisal systems often have results directly opposite from those intended and that managers need to consider the human consequences of any systems which they initiate. In fact, Mintzberg [1975] pointed out that "organizational objectives are often rigid and dysfunctional and encourage the manager to use inappropriate information" (p. 2).

A stream of literature has investigated the dysfunctional consequences of using ABPM. This body of literature recognized that consequences inevitably accompany the use

of ABPM and that these may lead to behavior contrary to the desires of the owners of the corporation. Babchuck and Goode [1951] described a situation where a company changed sales performance measures in order to eliminate such dysfunctional consequences. The old measures had encouraged individual antagonism and a parochial focus on sales. The new measures increased group cooperation and motivated employees to perform on nonsales duties which were essential to company success.

Other researchers also provided evidence of dysfunctional consequences of performance evaluation. Granick [1954] studied Soviet management and reported that they delayed repairs and maintenance to improve their individual performance records. These employees behaved in order to improve their performance on production indices at the expense of overall plant production. Later Blau [1955] found that employees' behavior diverged from that desired by the business because of the way employees were evaluated. Finally, Dearden [1960] discussed instances where the method of evaluating the investment performance of decentralized divisions caused the division managers to make asset replacement and retirement choices which were not in the best interests of the overall company. The decisions improved the performance indices for the divisions but decreased the overall profit of the organization.

The dysfunctional consequences of budgeting have been investigated by a number of researchers. Studies have shown, for example, that individuals responded to budgeting with data manipulation [Lowe and Shaw 1968; Hopwood 1972; Yetton 1976], game playing [Collins, Munter and Finn 1987], and slack building [Young 1985; Merchant 1985; and Waller 1988].

Dysfunctional consequences of short-term performance measures. Thurow [1981] blamed short-term performance measures for the difficulties encountered by American corporations in international competition. He argued that the problem arises not because American managers are stupid or impatient, but because business has created an environment where it is rational to have a short time horizon. The choice of information

systems emphasizing short-term performance may be a major contributor to the inability of American corporations to compete with foreign competitors. Consistent with this theory, Merchant [1989] pointed out that managers follow "Gresham's Law of Planning," that is, they have a tendency to let short-term concerns dominate. This creates a need to redirect attention to long-term concerns (for example, through ABPM that emphasize long-term performance).

Hayes and Garvin [1982] reported that choices of ABPM may bear some responsibility for the changes in capital and R&D expenditures between 1948 and 1973. When adjusted for inflation, changes in GNP, or work force size, these expenditures had actually declined over the 25 years. Hayes and Garvin posited that this decrease may have been due to a move toward multidivisional organizations, which primarily evaluate managerial performance using short-term financial measures.

Indeed, it may be that the source of this myopic emphasis on short-term profitability (quarterly and yearly results) is traceable to the accounting system. Accounting systems have been based on traditional accounting measurements that require the life of the business to be separated into artificial accounting "periods." And as critics of accounting have remarked, managers have been rewarded for profit performance in the current period [Merchant and Bruns, 1986], rather than over the long term.² Elliot [1990] referred to this as the U.S. financial accounting paradigm.

The above "accusations" that short-term performance measures have affected decision making have some limited empirical support. The little empirical work that has been done to determine how time influences the decision process has been in psychology.

²This is in contrast to Japan where long-term growth is pursued. Tsurumi and Tsurumi [1985] point out that, "Few Japanese firms use quarterly or even annual earnings per share or other similar financial indices as their performance guides" (p. 29). However, it is not possible to infer that long-term measures caused Japan to be internationally competitive. Their use of long-term measures may only reflect their long-term commitment to the company or their focus on long-term goals. However, given that the United States uses short-term performance measures, regardless of the reason why, it is interesting to investigate whether these measures do indeed lead to dysfunctional behavior.

Nisan and Minkowich [1973] explored how variation of the distance between action and outcome affects the salience of decision variables. They found that if the outcome was temporally distant, subjects considered probabilities more salient than values. The reverse held true for temporally close outcomes. Further, subjects behaved differently if they were dealing with gains or losses that were temporally distant. Gains induced lower risk-taking than losses.

In an attempt to develop a theory to explain patients' tenure under a treatment program, Christensen-Szalanski and Northcraft [1985] found that the temporal distribution of costs and benefits have a direct impact on behavior. They explored the use of contracts used to bridge the gap between the short-term costs of medical treatment and the long-term gains from the outcome of the treatment. The success of these contracts has direct implications for the possibility of varying the temporal aspects of ABPM to influence behavior.

The results of Stevenson's [1986] study also had design implications for ABPM. She found that outcomes with positive expected value were more desirable the closer they were to realization and those with negative expected value were preferred the further they were from realization. This and other studies of time's impact on the decision process [Loewenstein 1988; Benzion, Rapoport, and Yagil 1989] imply that it may be possible to use the time span of ABPM to channel individuals' decision processes toward that desired by owners.

In this study it is proposed that the frequency of accounting reports will impact the "self-presentation" behavior of individuals. Accordingly, the self-presentation literature is reviewed in the next section.

Self-presentation Literature

The effect of ABPM on behavior may be moderated by various psychological determinants of behavior. The act of evaluating a manager's performance may cause the

manager to have evaluation apprehension [Rosenberg 1969] and to behave in ways that he perceives will improve his evaluation. For example, Tan [1991] found that auditors who anticipated a review behaved differently from those who did not. When anticipating a review, auditors who had generated prior-year work papers paid more attention to audit evidence inconsistent with their expectations and were less extreme in their judgments than the auditors in a new audit situation. When no review was anticipated, there was no difference between the groups. Prakash and Rappaport [1982] referred to this process, where an information sender is influenced by the information required for communication, as information inductance.

One potentially important theory for explaining the psychological processes that may moderate the effect of ABPM on decision making is self-presentation theory (hereafter referred to impression management). The essence of impression management, according to Schlenker [1980], is that people attempt to establish, monitor and control their identities in front of others so that they may control the outcomes that stem from interactions with others.³ In organizations, desired outcomes such as bonuses are often contingent upon the results of performance evaluations. Because the outcome of the performance evaluation is important to the manager, the motivation exists to manage the image presented to the evaluator. It is possible that the manager's perception as to which image will result in a better outcome is contingent upon the type of evaluation used.

Schlenker [1980] posited that people behave in order to maximize expected rewards and minimize expected punishments. If people expect that a certain impression will

³People may feel accountable to themselves, to people with whom they interact, and to others who are prominent in their life [Schlenker, 1986]. This study is designed to focus the subjects on accountability to others. According to Schlenker, "When people's attention is focused on how the self appears to others, the expectations of those others become salient. People are then more likely to conform in the face of real or imagined social pressures and to play socially expected roles" (p. 73). In this study there is no attempt to measure or increase accountability to the self. Because subjects are randomly assigned to treatments (discussed in Chapter 4), it is assumed that individual differences in personality variables that are likely to produce effects where the private self is most salient will be randomly dispersed.

increase rewards, they will go to great lengths to ensure this particular impression has been conveyed to others. This is not surprising since most desired outcomes are dependent not only upon the person performing the behavior, but also upon others. Therefore, people may influence the attainment of desired outcomes by influencing the impressions others form of them.

As evidence of impression management, Jones et al. [1965] found that subjects behaved differently, depending upon the personal values they ascribed to the person responsible for their rewards. Subjects behaved in an independent manner when they believed the superior valued productivity but in a conforming manner when they believed that the superior valued solidarity and "going along."

More recent research provides evidence of impression management. Schlenker et al. [1983] conducted a laboratory experiment with undergraduate psychology students. They found that the students adjusted the image they presented to others depending upon what they had been told about the beliefs of the interviewers. The laboratory experiment by Kardes and Kimble [1984] reported that subjects who anticipated future interaction with an individual were more informative in good news than in bad news conditions. The news described the other individual's performance on the "Social Sensitivity Test." It was good news if the subject was told the individual scored high. The converse was true in the bad news condition. Subjects who did not anticipate future interactions were more informative in bad news conditions than in good news conditions.

Sunk Cost Literature

An individual's tendency to commit escalation errors, i.e., to consider sunk costs in decision making, may be driven by impression management. An individual who commits these errors may be attempting to present a positive image to those to whom he or she is responsible. This study considers impression management in a scenario where there is

pressure to commit such an error, and therefore the sunk cost literature is especially relevant.

Much of the research investigating the sunk cost effect has been based on the premise that individuals need to justify their actions [Brockner 1992]. This justification represents an attempt to manage a positive image regarding past decisions. Staw [1980] suggested that the more an individual is motivated to predict and control the environment, the more likely that the individual will be susceptible to forces that are counter to rationality. He proposed that the stronger these forces, the more the individual will feel the need to justify his or her decisions. The justification may be internal, to protect one's self-concept, or external, to protect one's image. Staw predicted that "The need to justify one's actions increases as the irrationality of one's actions is exposed both to self and others" (p. 57). Some of the determinants of this need to justify past decisions, according to Staw, are personal responsibility for negative consequences (prior choice and foreseeability of outcomes) and the organizational norms for rationality.

Staw and Ross [1987] proposed a model of commitment to a course of action. They identified four categories of escalation determinants: project, psychological, social, and structural (hereafter referred to as organizational). The following sections will review some of the relevant research on these determinants of individuals' tendencies to escalate commitment to a course of action.

Project Determinants

The characteristics of a project may have an impact on the tendency toward escalation. These are the objective characteristics of a project (e.g., project goals). Staw and Ross [1978] investigated whether an individual's investment allocation decision would differ according to whether the causes of success or failure were endogenous (directly related to the project itself, most likely to recur if the project continued, and relatively foreseeable) or exogenous (not directly related to the project, least likely to recur if the

project continued, and not foreseeable). Staw and Ross found that student subjects who received positive feedback following an original investment did not vary their second commitment of resources, regardless of the cause of success (exogenous or endogenous). Subjects in the negative feedback condition, however, did react differentially to the cause. If it was exogenous (endogenous), they invested more (less) than in any other case. The subjects were more aware of causal data in the case where they had a failure.

Psychological Determinants

Psychological determinants are factors that "influence one's goals and beliefs about the consequences of an action" [Staw and Ross 1986, p. 55]. Arkes and Blumer [1985] conducted a number of experiments using psychological determinants (such as the need for self-justification) and found consistency with the sunk cost effect. For example, in a field study, theater patrons who spent more for their season tickets attended significantly more performances during the first half of the season than those who spent less. The decision whether or not to attend a performance appeared to be influenced by the size of the season ticket investment. Arkes and Blumer did not find that personal involvement increased the sunk cost effect or that learning economic principles lessened the effect. They concluded that the sunk cost effect is a robust judgment error.

Social Determinants

Social determinants such as the need for external justification also affect commitment to a course of action. Staw [1976] pioneered research regarding the effects of social determinants on escalation behavior. He investigated the effects of personal responsibility and decision consequences on the amount allocated to a previously chosen investment alternative. The task was the allocation of R&D funds to one of two divisions over two periods. Following the original allocation, the subjects received feedback (either negative or positive) regarding the success of the first-period allocation. Subjects in the

high-responsibility condition made the allocation decision in both periods; those in the low-responsibility condition were told the first-period allocation had been made by another party. A significant interaction effect was found for personal responsibility and feedback. The amount invested in the high-personal-responsibility, negative-feedback condition was higher than in any other condition. Under low responsibility, the feedback did not have any effect.

Staw and Fox [1977] replicated Staw's study and extended his work to consider the effects of the probability of investment of resources resulting in positive outcomes and the effects of intertemporal decisions (three periods). All subjects received feedback that their previous decision had resulted in negative consequences. Staw and Fox found that over time the low probability and low-personal-responsibility subjects did not vary their commitment. The high-responsibility and high-probability subjects, however, were unstable. They invested most at time one, least at time two and an intermediate amount at time three. Due to this instability and the lack of variability in commitment over time by both low-responsibility and low-probability subjects, the researchers concluded that escalation did not diminish over time with negative feedback.

Organizational Determinants

The structural features of an organization may influence escalation tendencies of individuals. Fox and Staw [1979] investigated the effects of organizational determinants. They manipulated job security and resistance to policy choices to determine their effects on the amount of money committed to policy choices. They hypothesized that if a subject received negative feedback regarding a policy choice, faced high policy resistance, and had low job security, the subject would be most likely to escalate commitment to the policy choice. This hypothesis was based on the idea that if the subject had implemented an unpopular policy, there would be more pressure to avoid failure. Similarly, if an individual's job security were low, there would be more motivation to save a failing policy

rather than admit failure. The hypothesis was supported. Additionally, commitment of resources was lowest in the low-job-insecurity and low-resistance condition. There were main effects for both job insecurity and policy resistance on the amount of resources committed.

The Present Research

The literature reviewed above has examined both differences in performance evaluation effectiveness due to organizational factors and differences in behavior due to individual reactions to performance evaluation. However, the effect of the time span of performance evaluation on individual behavior has not been the central focus of research to date. The question that this study poses is whether varying the frequency of performance evaluation using accounting-based performance measures will affect an individual's psychological processes and resulting decisions. This query is especially relevant in light of evidence of potential dysfunctional consequences of ABPM and the nature of concerns expressed about the short-term emphasis in financial statements. The answer to this question will provide an extension to the present accounting-based performance evaluation literature and may have implications for motivating managers behavior to behave in a manner more consistent with organizational objectives.

CHAPTER 3 MODEL DEVELOPMENT AND RESEARCH HYPOTHESES

Introduction

This chapter describes the influence that the frequency of accounting-based performance reports may have on an individual's tendency to escalate commitment to a course of action. Kanodia, Bushman, and Dickhaut [1989] showed analytically that escalation errors are driven by the lack of commitment by the employer to ignore switching decision information. Furthermore, they found that when a manager's reputation is considered, escalation behavior can be economically rational. This study incorporates their findings by examining how varying the frequency of performance evaluation may change a manager's perception of possible negative repercussions from switching to a superior investment. The purpose of the current model is to present the effect of performance evaluation on behavior as a function of cognitive processes. Hypotheses are developed for the effects of performance evaluation.

The Model

The conceptual model of the effect of performance evaluation on psychological processes underlying the investment choice is developed from the relevant psychological literature.

When an individual chooses between two alternatives, it is posited that he or she considers the results (hereafter called benefits) of each alternative.¹ The benefits can affect

¹Because the costs of a decision can be reframed as the benefits of the alternative, only the benefits are considered. This eliminates the possibility of double-counting.

either the individual (called personal) or the organization (called organizational). How an individual will be evaluated should affect the perception of these benefits.

In this model it is posited that the Frequency of Performance Evaluation (short-term or long-term) will affect the perceived benefits of a choice between remaining committed to an investment (escalating) or changing to an alternative (switching).² Specifically, because the act of evaluating a manager's performance represents a form of public scrutiny, it will affect an individual's perception of the image which he or she can claim and the expected "value" of this claim.³ As explained in the following sections, through its effect on the image, performance evaluation influences the perception of Personal Benefits from Escalating.

The effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating may be moderated by the individual's perception of the ability to manipulate his or her image to others. The effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating may also be moderated by whether an individual places a higher priority on personal welfare than on doing the job "right." Finally, all types of perceived benefits (personal or organizational, resulting from switching or escalating) will affect the decision to escalate or switch. The variables in this model are shown in Figure 3-1, described in the following section, and summarized in Table 3-1.

Frequency of Performance Evaluation

Since the purpose of this study is to examine the influence of the Frequency of Performance Evaluation on decision making, the focus is on two discrete levels of time: short-term (ST) and long-term (LT). This independent variable is higher if an individual is

²Hereafter all variable names will be capitalized.

³In this study, value and expected value refer to the general expectations of the worth of a particular action. These terms do not refer to the traditional mathematical representations where probabilities and values are combined to determine expected value.

Table 3-1
Summary of Variables

NAME	DEFINITION	TYPE	LEVELS	MEASURED
Frequency of Performance Evaluation	Frequency of Performance Evaluation	H1-IV H2-IV H3-IV	Discrete Two Levels: ST, LT	Randomly Assigned
Perceived Benefits	Weighted number of perceived benefits		Continuous	Measured: Open-list and Fixed-list
OBS	Organizational Benefits from Switching	H4b-IV		
OBE	Organizational Benefits from Escalating	H4a-IV		
PBE	Personal Benefits from Escalating	H1-DV H2-DV H3-DV H4a-IV		
PBS	Personal Benefits from Switching	H4b-IV		
Ability to Manipulate One's Image	Perceived ability to manipulate image	H2-MV	Continuous	Measured: General Self-Efficacy Scale, Aggression Scale
JOBRITE	Degree to which a subject considers doing the job right instead of personal consequences	H3-MV	Continuous	Measured: Post-Experimental Question
Periods Until Switching	Number of periods until the subject switches to the alternative investment or does not switch	H4a-DV H4b-DV	Discrete Three Levels: Switch Period 2, Switch Period 3, Never Switch	Measured

Key: DV-Dependent Variable
IV-Independent Variable
MV-Moderating Variable

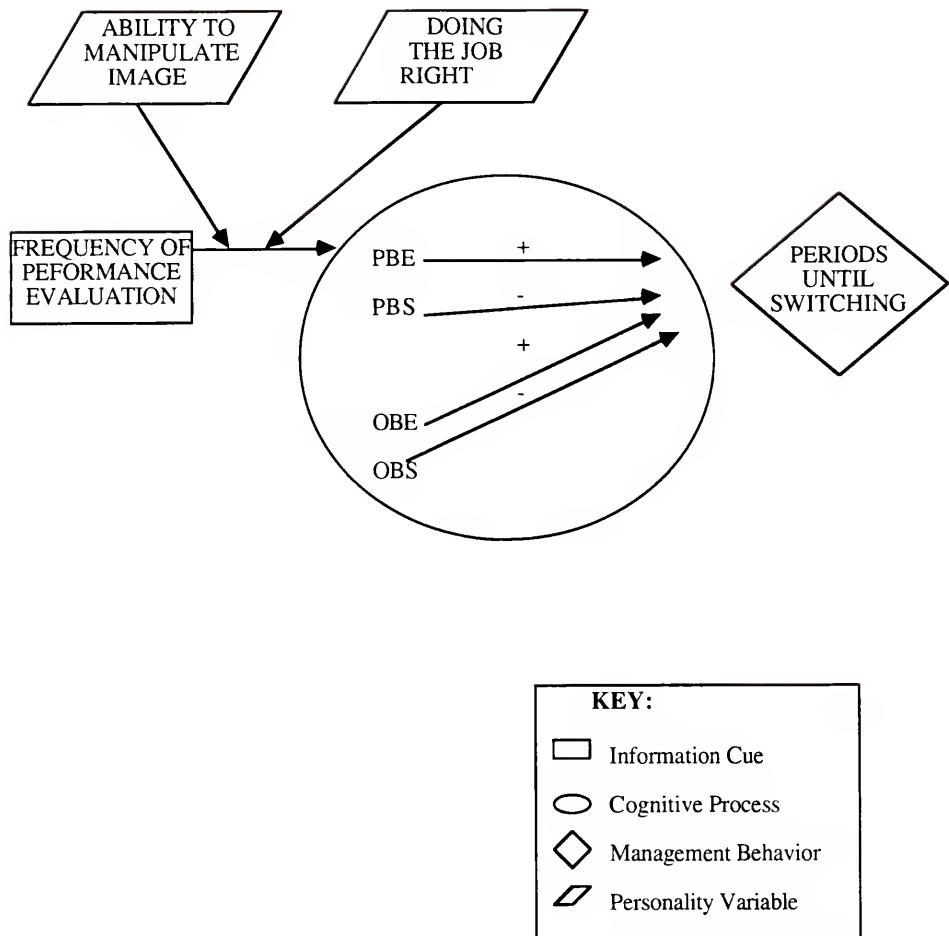


Figure 3-1
Conceptual Model of the Effect of Performance
Evaluation on Escalation Behavior

evaluated frequently over the course of a project (ST) and lower if an individual is evaluated at the end of a project (LT).

Perceived Benefits of an Action

When the individual is presented with a superior alternative investment following acceptable feedback regarding the original investment choice, there are two possible actions: escalate commitment or switch to the alternative investment.⁴ During this decision, the individual considers the benefits of both options. The benefits which result from the decision are personal or organizational.

The following discussion describes the predicted perceived benefits of each action: Organizational Benefits from Escalating, Organizational Benefits from Switching, Personal Benefits from Switching and Personal Benefits from Escalating. These benefits are summarized in Table 3-2. Benefits resulting from the original investment's performance exist regardless of whether the individual decides to escalate or to switch. Therefore, it is predicted that the individual will eliminate this information from the evaluation (see Kahneman and Tversky [1979] for a discussion of editing). After this elimination, the benefits associated with each action diverge.

Organizational Benefits from Escalating. If an individual escalates, the benefit to the organization for remaining with the current project is a continuance of the neutral economic performance which occurred in the previous period.

Organizational Benefits from Switching. If an individual switches, it is assumed that the new project will be successful, or at least more successful than the current project.⁵ Therefore, the company will receive improved cash flows in future periods.

Personal Benefits from Switching. The individual who switches will have a positive image associated with the future positive cash flows.

⁴In this study subjects received feedback that their investment choice met the budget. Hereafter, this feedback is referred to as neutral feedback.

⁵The case developed for this study was intended to present the alternative project as one with a high probability of success. However, some subjects perceived it as a risky project. The implications of this are discussed in Chapter 5.

Table 3-2
Predicted Perceived Benefits of an Investment Choice

		Benefits from Switching	Benefits from Escalating
ST	Organizational	1. Future Positive Economic Outcome	1. Future Neutral Economic Outcome
	Personal	2. Future Positive Image for project success	2. Future Neutral Image for project meeting budget 3. Positive consistent image 4. Avoid negative image of mistake, bearer of bad news associated with switching
LT	Organizational	1. Positive Overall Economic Outcomes	1. Neutral Overall Economic Outcomes
	Personal	2. Positive Overall Image for project success	2. Neutral Overall Image for project meeting budget

The Frequency of Performance Evaluation may affect an individual's perception of these three types of benefits. Consistent with economic theory and the research on time discussed in Chapter 2, it is possible that temporally distant outcomes will be discounted relative to those that are closer. With ST performance evaluation, future benefits for escalating or switching are not explicitly recognized at the time of the action. With LT evaluation, these benefits are recognized because the project has been completed. This could cause individuals to weight LT benefits greater than ST benefits. However, this

relationship is complicated by the fact that the LT performance evaluation is also temporally distant. The effect of Frequency of Performance Evaluation may be minimal in this situation. Therefore, it is not predicted that Frequency of Performance Evaluation will affect the perception of these three types of benefits.

Personal Benefits from Escalating. It was predicted above that the Frequency of Performance Evaluation would not affect the perception of the Organizational Benefits from Escalating, Organizational Benefits from Switching or Personal Benefits from Switching. Using the same logic, the Frequency of Performance Evaluation is unlikely to affect one of the Personal Benefits from Escalating. Specifically, the Frequency of Performance Evaluation does not affect the neutral image associated with neutral economic performance because this benefit occurs with either type of evaluation.

However, two additional Personal Benefits from Escalating may occur only if an individual is evaluated in the short run. First, the individual may present an image of consistency and confidence. Norms of society tend to encourage consistency and discourage inconsistency, and therefore, people manage impressions to establish the image of consistency [Schlenker 1980]. Second, escalating makes it possible to avoid the admission of having made a mistake. Research has demonstrated how distasteful it can be to admit to having made a mistake. It has been shown that subjects will sacrifice monetary payoffs to minimize public embarrassment [Brown 1968; Brown 1970; Brown and Garland 1971; Garland and Brown 1972]. In fact, this tendency has been labelled the "MUM effect" whereby individuals tend to keep mum about negative messages [Kardes and Kimble 1984]. Individuals seem to perceive that the image of the messenger will be directly related to the message.

Based upon these expected perceived benefits, it is predicted that the frequency of accounting-based performance reports will influence the individual's perceived Personal Benefits from Escalating. The Frequency of Performance Evaluation is expected to have a negative effect on the continuous dependent variable Personal Benefits from Escalating.

Therefore, it is predicted that Personal Benefits from Escalating will be greater in the ST than in the LT condition.

H1: Where there exists pressure to escalate commitment, the perceived Personal Benefits from Escalating will be greater when an individual is evaluated in the short run than when an individual is evaluated over the long run.

Possible Interaction Effects

Hypotheses 2 and 3 explore the possibility that the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating will be moderated by other variables. Two possible interactions are proposed. The first is that an individual's perceived ability to manipulate his or her image to others may influence the relationship between the Frequency of Performance Evaluation and Personal Benefits from Escalating. The second is that the same relationship is also moderated by an individual's attitude toward doing the job "right."

Ability to Manipulate One's Image. An individual's perceived ability to manipulate his or her image to others has been described as self-presentational efficacy expectancies [Leary and Atherton 1986; Maddux et al. 1988]. These expectancies consist of self-efficacy and outcome expectancies. This study is concerned with the self-presentational outcome expectancy, defined as the subjective probability that a person can perform a specific behavior intended to convey a particular impression.

In the short-term evaluation condition, there are more benefits from escalating than from switching because of the need to protect one's image. It is possible, however, that if an individual has a low self-presentational outcome expectancy, he or she will not perceive an ability to control the image presented to others. In this case, the individual probably would not consider those benefits to the image in the decision (or would consider them as less important); and the benefits from switching would outweigh the benefits from escalating. Lack of consideration of the benefits to the image would cause the benefits of

short-term evaluation to be the same as the benefits of long-term evaluation. In both cases the individual would not consider benefits to the image. This is true in the long-term condition because there is no need to protect one's image since switching behavior is no longer salient (see Table 3-2). Therefore, the Frequency of Performance Evaluation may only affect those who believe they can control their image to others. It is predicted that the perceived Ability to Manipulate One's Image will moderate the relationship between the Frequency of Performance Evaluation and Personal Benefits from Escalating. The effect of the Frequency of Performance Evaluation will be greater the higher the perceived Ability to Manipulate One's Image.

This prediction is illustrated in Figure 3-2.

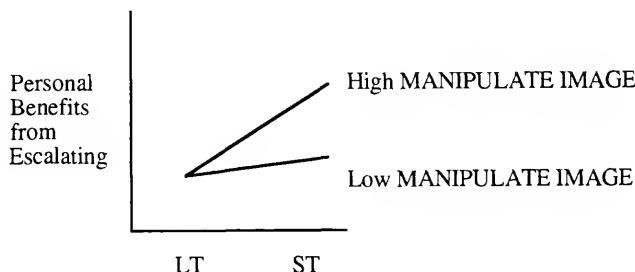


Figure 3-2
Predicted Interaction of the Perceived Ability to Manipulate One's Image to Others and the Frequency of Performance Evaluation

The following hypothesis is based upon this prediction.

H2: Where there exists pressure to escalate commitment, there is an interaction between the Frequency of Performance Evaluation and the perceived Ability to Manipulate One's Image affecting Personal Benefits from Escalating.

The interaction is such that the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating becomes stronger as the perceived Ability to Manipulate One's Image becomes greater.

Doing the Job Right. The degree to which a person considers doing the job "right" affects the salience of performance evaluation. If a person considers personal welfare to be

more important than doing the job right, the type of performance evaluation is significant because it differentially affects personal benefits. There are more implications for personal benefits from escalating with short-term performance evaluation than with long-term. On the other hand, if doing the job right has a higher priority than personal welfare, the type of performance evaluation is irrelevant because the correct action is identical in either condition. The variable, "Doing the Job Right" has a higher value if a person considers doing a job "right" before considering how he or she is affected personally. Because the level of Doing the Job Right affects the importance of performance evaluation, it will moderate the relationship between the Frequency of Performance Evaluation and Personal Benefits from Escalating. It is predicted that the Frequency of Performance Evaluation will not affect Personal Benefits from Escalating if the individual has a high level of Doing the Job Right, because there is no distinction between long-term and short-term performance evaluation. The lower the level of Doing the Job Right, the greater the effect the Frequency of Performance Evaluation, because the distinction between long-term and short-term performance evaluation is more salient.

This prediction is illustrated in Figure 3-4 and is the basis of the following hypothesis.

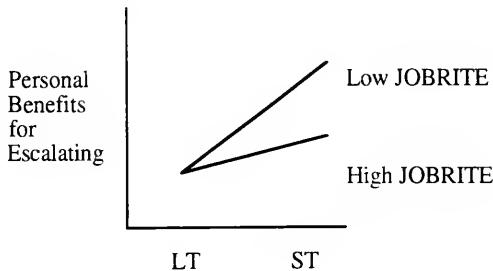


Figure 3-4
Predicted Interaction of the Consideration of Doing the Job Right (JOBRITE)
and the Frequency of Performance Evaluation

H3: Where there exists pressure to escalate commitment, there is an interaction between the Frequency of Performance Evaluation and an individual's consideration of Doing the Job Right, affecting Personal Benefits from Escalating.

The interaction is such that the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating becomes stronger the less the individual considers Doing the Job Right.

Action: Switching or Escalating

After receiving information about a superior alternative investment, if an individual perceives more benefits from switching than from escalating, it is predicted that the individual will change to the alternative investment project. Alternatively if an individual perceives more benefits from escalating than from switching, it is predicted that the individual will escalate commitment to the original investment project. The ordinal dependent variable (three levels), Periods Until Switching, has a low value if the individual makes the economically rational choice and switches to a superior alternative investment and has a high value if the individual does not switch. These predictions are presented in the following hypotheses.

H4a: Where there exists pressure to escalate commitment, there will be two positive correlations: 1) between Personal Benefits from Escalating and Periods Until Switching, and 2) between Organizational Benefits from Escalating and Periods Until Switching.

H4b: Where there exists pressure to escalate commitment, there will be two negative correlations: 1) between Personal Benefits from Switching and Periods Until Switching, and 2) between Organizational Benefits from Switching and Periods Until Switching.

Summary

In this chapter, a model of the differential effect of the frequency of accounting-based performance reports on the capital budgeting decision in an escalation context was presented. Dichotomizing the perceived benefits into personal and organizational categories, the model described the effect of the frequency of accounting-based

performance reports on a specific subset of benefits: Personal Benefits from Escalating. In addition, variables that moderate the relationship between the Frequency of Performance Evaluation and Personal Benefits from Escalating were included in the model. Chapter 4 details the experiment that was conducted to test the predictions of this model.

CHAPTER 4 RESEARCH DESIGN AND DATA ANALYSIS METHODS

Introduction

This chapter describes the research method used to test the hypotheses discussed in Chapter 3. First, the design of the experiment conducted to investigate the effects of the frequency of accounting-based performance reports on capital budgeting decisions is presented. Next, the chapter describes the data analysis methods and the predicted results.

Experimental Method

The study was conducted in a laboratory setting, and used students as subjects. The following sections present, in turn, the general setting for the experiment, the experimental materials, the experimental procedures (including the incentive structure), and the subjects.

General Setting

The original and subsequent investment choices were made in the context of a business simulation using an in-basket scenario. Subjects were asked to assume the role of Acting Capital Procurement Manager (a newly-created and possibly temporary position) of the Paging Division of Mototronics, an electronics corporation. As the Capital Procurement Manager they were asked to respond to corporate memos and narratives with comments and decisions concerning capital projects.

Subjects were randomly assigned to long-term or short-term performance evaluation conditions so that comparisons could be made between their cognitive processes and between their decisions. It was critical to the examination of the effects of the

Frequency of Performance Evaluation that the type of performance evaluation was made salient to the subjects. Therefore, the study necessarily encompassed several periods. In the experimental setting, each period represented a fiscal year. Subjects were told at the outset that the study would continue for multiple periods but were not told the actual number of periods.¹

Based on the results and predictions of the sunk cost literature, information designed to encourage escalation was contained within each case (see the Appendix for an example of these materials).

Experimental Materials

The case materials were developed over a series of pilot studies. Background information, instructions for completing the materials and the rules for earning payment were presented at the outset of the experiment. The subjects were asked to assume the role of Lee Chambers who had been temporarily assigned to fill the position of Acting Capital Procurement Manager. They were told that the position was not secure:

Unfortunately, you have only been temporarily assigned to fill the position (your official title is Acting Capital Procurement Manager). A complete evaluation of the reorganization which resulted in your promotion will occur within the next five years and your job will become permanent or you will be demoted back to Production Manager, depending on your performance. There is some uncertainty as to whether your former position will still be available because of the current recession and rising unemployment. In the meantime, you have to deal with other executives who are well-qualified and envious of your position. Indeed, they were unhappy that you were chosen over them to fill the temporary position. Thus, you cannot expect support and assistance from your peers, especially if you do not perform well immediately.

¹ Subjects were not told the number of periods in order to avoid the "finite-period paradox." This paradox occurs in multiple-stage experiments when the actual end of the experiment is known. If the timing of the end of the experiment is known, instead of treating the experiment as a multiple-stage game, subjects treat it as a series of single-stage games. If the timing of the last interaction is unknown, this problem should not occur [Luce and Raiffa 1967; Kreps and Wilson 1982; Axelrod 1984].

They were also informed that would receive a performance evaluation on the degree of success or failure of their decisions. This evaluation would be based on their "reactions to the situations described in the case and would account for a wide variety of information: cost attainment and relationships between the principal actors in the case, to name a few." After being informed of the experimental procedure, they began the experiment. The experimental materials, listed in order of presentation, are described below.

Period 1. Subjects received the following materials:

1. A memo from the Personnel Manager congratulating them on their new position and providing details about the position, including an organizational chart and information regarding the timing of their performance evaluation (annually or at the end of the project's life).
2. The planned production of pagers through 1995.
3. Information regarding the choice between two machines which would be used to manufacture outside housings for a new pager. The choice was between machine 0036 and machine 0073. The scenario was designed so that the only major difference between the two machines was that 0036 was produced in Arizona and 0073 was produced in New York.

Period 2. Subjects received these materials:

1. A memo from their superior discussing the negative reaction of the Board of Directors to their decision made in period 1 and their superior's defense of their decision. This memo was included to encourage escalation by creating high policy resistance to the original investment choice. An example of this policy resistance is:

... several Board members were very dissatisfied and critical of your recommendation and were firmly prepared to vote against it. Although they were highly skeptical and critical of your recommendation and were firmly convinced you had recommended the wrong course of action, in the final analysis, the Board reluctantly deferred to your judgment. (Lee, I really have to point out that I believe the Board finally agreed to

support your recommendation because I went out on a limb for you and defended your decision, not because they were pleased).²

2. A Production Cost Report indicating that the costs of their choice, as well as other current investments under their management, had remained within budget (neutral feedback).³

3. A performance evaluation (ST condition only). The performance evaluation was based upon the fact that expenses related to the investments did not exceed budget and "upon overall performance." Performance for the period was rated "good."

4. A memo from their assistant with private information about an alternative machine which would cut costs by 75%.⁴

²The Job Insecurity and Policy Resistance manipulations were modeled after Staw's [1979] Adams and Smith Decision Case. Staw's study showed that escalation of commitment was strongest when these variables were present. In the present study these manipulations are used verbatim with slight changes to reflect the different decision, company, etc. These are reprinted from "The Trapped Administrator: Effects of Job Insecurity and Policy Resistance upon Commitment to a Course of Action" by Frederick V. Fox and Barry M. Staw published in Administrative Science Quarterly (volume 24, number 3) by permission of Administrative Science Quarterly. Copyright 1979 Cornell University.

³The instrument used in the first pilot studies contained negative feedback regarding the original investment choice. Subjects who participated in the pilot studies which tested this instrument complained that they had no control over the outcome and felt hopeless. Therefore, the feedback was changed to neutral in order to alleviate these problems and to direct the subjects' attention to the questions of interest.

⁴This feedback was structured so that the subsequent *correct* decision was to switch to the superior alternative investment. Subjects continued to receive this feedback until they switched to the alternative investment. For example, a subject deciding to invest in machine 0036 received feedback that the alternative investment was superior until he or she switched (if ever) to Machine 0073. This decision is illustrated in Figure 4-1. Once a subject switched, he or she received feedback which indicated that it was best to remain with the new investment. If the subject received feedback that it was best to switch back, it would have been possible to infer lack of causality, inducing the subjects to make meaningless future decisions (as may have applied in Staw and Fox [1977]).

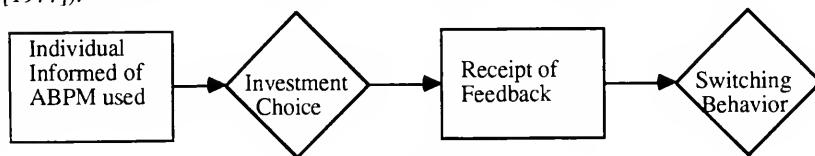


Figure 4-1
The Decision Context

5. A list of facts regarding the case designed to remind the subjects of pressures to escalate, followed by a request for their choice of machine (the original machine or the alternative machine with 75% lower costs).

6. A request to complete four open-ended lists: "Specific benefits for me personally if I remained with xxxx, Specific benefits for Mototronics if I remained with xxxx, Specific benefits for me personally if I changed to xxxx, and Specific benefits for Mototronics if I changed to xxxx."⁵

7. A request to weight those benefits by allocating a total of 100 points among all the items in the four lists.

8. One list of 14 "Specific benefits if I remained with xxxx" (7 Personal and 7 Organizational) and one list of 14 "Specific benefits if I changed to xxxx" (7 Personal and 7 Organizational). The subjects were asked to indicate the importance of each benefit to their decision on a scale from 1 (not at all important) to 5 (extremely important).⁶

Period 3. Subjects received the following:

1. Production Cost Report indicating that the cost of their choice, as well as the other current investments, had remained in budget.

2. Performance Evaluation (ST condition only). If the subject had escalated, the performance evaluation was "good," if the subject had switched, the performance evaluation was "excellent."

⁵Machine numbers are designated "xxxx" because the materials contained either 0036 or 0073 depending upon the original choice of the subject.

⁶The items on the lists were developed from the results of open-ended responses from the pilot studies and from the theory discussed in Chapter 2. They consisted of two 14-item lists of benefits for switching and benefits for escalating. Within each list there were seven organizational benefits and seven personal benefits which were randomly mixed. The results of the final pilot study tested the reliability of the four subscales (Personal Benefits from Escalating, Personal Benefits from Switching, Organizational Benefits from Escalating and Organizational Benefits from Switching). All had alphas .77 or greater, therefore the scales were used in the actual experiment.

3. Information regarding the choice between their machine and the alternative. If they had escalated they had a choice between further escalation or switching. If they had switched they could remain with the new project or change back to the original investment.

Period 4. Subjects received the following:

1. Performance Evaluation: "good" if they escalated during the entire experiment, "excellent" if they switched at any point during the experiment.
2. Post-experiment questionnaire.
3. Aggression and General Self-efficacy questionnaires.

Experimental Procedure

The experiment began with a briefing by the researcher. Next, the subjects were given the experimental materials in a set of envelopes and were required to work with one envelope of materials at a time. When cued, subjects chose the next envelope which reflected their previous choice. For example, the first decision required subjects to choose either Machine 0036 or Machine 0073. If the subject chose Machine 0036, he or she then completed the next envelope of materials which was labelled, "Yr 1 0036" and similarly "Yr 1 0073" if he or she had chosen Machine 0073.

Because the students participated in the experiment during one class period it was not possible to conduct the experiment over multiple periods. Therefore, in order to create the illusion of "years" passing, participants were given a set amount of time for each "year" (year one-20 minutes, year two-35 minutes, year three-5 minutes, year 4 and post-experimental questionnaire-10 minutes). Participants were required to work only on the applicable year during the time allotted and were not permitted to advance to the next year's set of materials until a timer rang, signifying the completion of one year.

All subjects completed a post-experimental questionnaire which elicited data on the strength of the manipulations. This questionnaire measured the face validity of some of the manipulations by asking the subjects to rate on a five point scale (coded 1=strongly

disagree to 5=strongly agree) the degree to which they agreed with certain statements. The subjects were also asked to provide general comments regarding the experiment and to answer questionnaires measuring their the perceived ability to manipulate their image to others.

Incentive structure. To provide the subjects with motivation both to participate in the experiment and to behave in a self-interested manner, lottery tickets were used as rewards. Subjects were informed that the tickets would be awarded based on three measures. The first measure was how well the subjects responded (as Lee) to the situations provided in the experiment. The second measure was based upon Lee's final position with Mototronics. Finally, subjects earned tickets based upon Lee's performance evaluation.

It was expected that providing monetary compensation based upon these variables would heighten the salience of the time, job security, and policy resistance manipulations, and accentuate the fact that compensation depended on the superiors' overall assessment of their behavior.

The actual allocation of tickets was based upon the following rules. For the first category (how well they responded) each subject began with 10 points. Points were then subtracted for missing answers and for incorrect answers. For the ending position category, all subjects were retained as the permanent Capital Procurement Manager (5 tickets) unless they had done an extremely poor job on completing the materials in which case they were demoted to Production Manager (2 tickets) or fired (0 tickets). Finally, tickets were awarded based upon the final performance evaluation rating: 6 tickets for a "good" evaluation, 10 tickets for an "excellent" evaluation. The average number of tickets earned for overall performance was 8.18, for ending position 4.49, and for the final performance evaluation 8.48. Each lottery ticket represented a chance to win one of seven cash prizes. The prizes offered were one award of \$200, two awards of \$100 and four

awards of \$50. The drawing was held the Saturday following the completion of the experiments.

Whether a performance-contingent incentive results in better performance than straight pay or no financial incentive, seems to depend on the situation [Ashton 1990]. Libby and Lipe [1991] showed that performance-based payments increased effort when effort-sensitive processing was required for the task. Their study provides support for using the lottery system in this experiment since effort is required to process the information provided to the subjects (i.e., it is not a highly-structured decision).

Furthermore, Bolle [1990] found that, in experiments where decision costs were small and choices were anonymous, subjects' behavior did not differ between a randomized reward structure and a deterministic reward structure.

Subjects

Subjects were recruited from a first-year Masters of Business Administration cost accounting class and from undergraduate and graduate accounting classes. Sixty-five MBA students participated during their regular class. The remainder of the subjects (43) participated outside of regular class time. Participating undergraduate Cost 1 students received extra-credit toward their class grade.⁷

Table 4-1 contains a summary of demographic information for the subjects. A majority of the subjects were male (71%), graduate students (63.3%), had held full-time jobs (68.8%), and had GPA's 3.0 or above (91.7%). Accounting majors made up 39% of the sample, while the remainder were finance (25.7%), management (3.7%), marketing

⁷Subjects drawn from corporate management represent the group to which researchers wish to extend their experimental results. However, as the theory upon which this study is based relies on basic psychological principles which apply to all individuals, the use of student subjects is considered acceptable as a starting point for examining the research in this area.

(13.7%), and other (14.7%). In addition, 33% of the subjects were between the ages of 18 and 22, 45% were between 23 and 27 years of age, and the remainder were over 28 (22%).

Table 4-1
Summary of Subject's Demographic Information

Grouping Variable	Number	Percentage	ST # (%)	LT # (%)
Gender				
Female	38	34.9%	19 (50)	19 (50)
Male	71	65.1	37 (52)	34 (48)
Major				
Accounting	42	38.5%	21 (50)	21 (50)
Economics	0	0	0	0
Finance	28	25.7	11 (39)	17 (61)
Management	4	3.7	2 (50)	2 (50)
Marketing	15	13.7	9 (60)	6 (40)
Other	16	14.7	11 (69)	5 (31)
Not Reported	4	3.7	2 (50)	2 (50)
Classification				
Undergraduate	38	34.9%	20 (53)	18 (47)
Graduate	69	63.3	35 (51)	34 (49)
Not Reported	2	1.8	1 (50)	1 (50)
Age				
18-22	36	33.0%	20 (56)	16 (44)
23-27	49	45.0	26 (53)	23 (47)
28-32	19	17.4	8 (42)	11 (58)
Over 32	5	4.6	2 (40)	3 (60)
Have held a full-time job				
Yes	75	68.8%	42 (56)	33 (44)
No	34	31.2	14 (41)	20 (59)
GPA				
2.5-2.9	9	8.3%	3 (33)	6 (67)
3.0-3.4	52	47.7	28 (54)	24 (46)
3.5-4.0	45	41.2	24 (53)	21 (47)
Not Reported	3	2.8	1 (33)	2 (67)

Variables

Due to concerns about the dysfunctional effects of short-term emphasis in performance evaluations, the investment decision modeled here is the choice of switching or escalating after the receipt of feedback regarding a superior alternative choice. Because the focus is on the effects of the Frequency of Performance Evaluation on the psychological processes underlying the investment decision, all other variables (e.g., personal responsibility, job security) were held or assumed to be constant across the Frequency of Performance Evaluation conditions.

Since the Frequency of Performance Evaluation was predicted to influence Personal Benefits from Escalating directly and to influence the number of Periods Until Switching indirectly through Personal Benefits from Escalating, it was necessary to measure Personal Benefits from Escalating and the number of Periods Until Switching as dependent variables. Perceived Benefits were also used as independent variables in the switching behavior model.

Following is a discussion of the independent, dependent and moderating variables.

Operationalization of Independent Variable

The theoretical construct of interest is the temporal relationship between the investment choice and the performance evaluation. Therefore, those in the long-term condition were exposed to a longer time period between the investment choice and evaluation than those in the short-term group. To operationalize this, the timing of the subjects' performance evaluation was varied between the short term and the long term. The Frequency of Performance Evaluation was manipulated between-subjects. Each subject was randomly assigned to one of two experimental treatment conditions: short-term or long-term performance evaluation. Those in the short-term condition (56 subjects) received the performance evaluation following the end of each period, prior to their subsequent

investment decision. Those in the long-term condition (53 subjects) received their performance evaluation at the end of the project life (at the end of four periods).

Measurement of Dependent Variables

The hypotheses discussed in the Chapter 3 concern five response variables: four of these concern perceived benefits (Organizational Benefits from Switching, Organizational Benefits from Escalating, Personal Benefits from Switching, and Personal Benefits from Escalating) and the other is the number of Periods Until Switching. The measurement of these response variable will be discussed next.

Perceived benefits. The benefits considered prior to making investment choices were measured, following the first feedback, directly after the subjects reported their second investment choice. The subjects were asked to list what specific benefits would accrue to themselves and to Mototronics as a result of their investment decision.

These representations are self-reports. The use of self-reports as data is a controversial issue. First, there is an unresolved question as to whether subjects are capable of self-reporting internal states [Nisbett and Wilson 1977; Smith and Miller 1978; Wright 1987; Wright 1988]. Ericsson and Simon [1980] posit that certain conditions make it possible for accurate self-reporting of internal states. For example, because of the limited capacity of short-term memory the experimenter can only expect to access the most recently heeded information. Moreover, Gordon and Braun [1986] stated "yet it is the self-report (verbal) data that provides some of the clearest insights into the confounding effects of common aspects of the instructional treatments" (p. 299).

Second, there are no recognized solutions to the problems with methodology [Eriksen 1962; Wright 1980; Ericsson and Simon 1980; Perone 1988]. Therefore, once an experimenter has decided to use self-reports as data the method of data collection must be tailored to the specific experiment. The relevant methodological issues in this experiment

were: the timing of data collection, the number of collections, and the types of probes. Each is addressed in the following paragraphs.

The first methodological issue concerns the timing of data collection. Subjects' thoughts may be collected during the actual decision (concurrently) or following the decision (retrospectively). Wright [1980] stated that it is difficult to judge which method more seriously affects completeness. Ericsson and Simon [1980, 1984] recommended retrospective collection if the processing episode is brief and if it is the most recent cognitive process that is measured. Because the processing episode is brief in this study, and because concurrent collection might cause subjects to alter their decisions, the data was collected immediately following the decision.

The second methodological issue is the proper number of data collections. The process of probing and self-reporting may itself affect subsequent behavior. For example, subjects may be alerted as to the experimenter's goals by the original probes and may then act in ways to meet those perceived goals. To avoid this problem, the data was collected once in the current study.

Finally, there is a question whether to use a directive or general probe. Each type of probe has relative advantages and disadvantages [Payne, Braunstein and Carroll 1978; Wright 1980; Ericsson and Simon 1980]. For example, a general probe may fail to encourage subjects to elicit the information desired by the experimenter. On the other hand, directive probes may encourage subjects to provide information they would not otherwise have provided. In order to overcome these problems both types of probes were used in this experiment. First, a general probe was used where subjects were asked to list the specific benefits for them personally and for Mototronics for both alternatives (open-list). This was followed by a fixed-alternative probe where subjects were asked to rate the importance of each specific benefit provided on a list (fixed-list).

Periods until Switching. This dependent variable is the number of periods until the subject switched. If the subject switched after the first feedback he or she received a score

of one. If the subject switched after the second feedback the score was two. Finally, if the subject did not switch the score was three.

Measurement of Moderating Variables

Ability to Manipulate One's Image. Leary and Atherton [1986] posited that self-efficacy (perceived ability to produce desired results) and outcome expectancies would be affected by dispositional factors such as General Self-efficacy, self-esteem, social skills or situational factors such as novel or ambiguous encounters.

In this study the construct of the perceived Ability to Manipulate One's Image is proposed to be represented by two individual variables: General Self-efficacy and Aggression. The perceived Ability to Manipulate One's Image should be greater the more that person has personal expectations of mastery over situations (General Self-efficacy). Furthermore, the perceived Ability to Manipulate One's Image of an aggressive individual should be greater than that of a less aggressive individual.

General Self-efficacy was measured using the Self-efficacy Scale [Sherer et al. 1982]. The Cronbach alpha reliability coefficient for this scale was .86 (p. 665). Aggression was measured using the Personal Assertion Analysis [Hedlund and Lindquist 1984]. Cronbach's alpha reliability coefficient was not provided by this study. However, the test-retest reliability coefficient was .70 (p. 381).

Doing the Job Right. The concern with Doing the Job Right was measured with a question on the post-experimental questionnaire. The question asked subjects to respond on a five-point scale (coded 1=strongly disagree to 5=strongly agree) to the statement, "In general, when I do a job, I am more concerned about doing the job "right" than with how it will affect me, my bank account, my family, etc."

Table 4-2 contains a summary of information on subjects' levels of Aggression, General Self-efficacy and consideration of Doing the Job Right. This information was collected after the experiment so that the subjects would not be sensitive to the researcher's

interest in their personality variables. The levels of Aggression, General Self-efficacy and Doing the Job Right were equal across long-term and short-term conditions, ensuring that this distribution would not confound the results of the hypotheses tests.

Table 4-2
Summary of Subject's Levels of Aggression, General Self-efficacy and Doing the Job Right (JOBRITE)

<u>Variable</u>	<u>Overall Mean</u>	<u>ST Mean</u>	<u>LT Mean</u>	<u>t=</u>	<u>p=</u>
Aggression	31.51	31.40	31.62	.33	.744
Efficacy	69.26	69.36	69.15	-.14	.890
JOBRITE	3.53	3.64	3.41	.97	.333

Data Analysis Methods

Data Screening

First, the computer output of raw data was compared to the original documents. This was followed by an analysis of frequencies for reasonableness.

Missing Values

Analyses were conducted with and without subjects whose output included missing values. Furthermore, subjects with missing values were compared to subjects without missing values to determine if there were commonalities among the groups.

Manipulation Checks

Whether subjects responded to the Frequency of Performance Evaluation manipulation was determined by comparing the means of the responses on the post-experimental questionnaire between the short-term subjects and the long-term subjects. If there was a significant difference between the two groups as to whether their performance

was evaluated annually it was assumed that they were cognizant of this manipulation. Significant differences on other post-experimental questions were not expected.

Nuisance Variables

If inspection of the data revealed the necessity to remove the effect of variables not hypothesized to affect the dependent variables, it was necessary to conduct partial correlation analysis, ANCOVA, or to include an additional variable in the multiple regression analysis.⁸

Scales

Two scales were used to measure subjects' perceived benefits: open-list and fixed-list. The open-list asked subjects to list their perceived benefits and weight each according to its importance in their decision. Subjects were then provided with a prepared list of benefits (fixed-list) and asked to rate the importance of each benefit listed in their decision. The fixed-list was tested for reliability.

The convergent validity of the open-list and the fixed-list was tested using correlations.

Test of Hypotheses

Personal Benefits from Escalating H1

The following equation was developed for the purpose of testing H1:

$$Y = B_1 + B_2 X^9$$

⁸This was important to ascertain due to the results of the original pilot study. This study had 31 subjects and was administered to an undergraduate cost accounting class. The effect of the Frequency of Performance Evaluation on Periods Until Switching was moderated by gender. Females tended to switch immediately while ST males escalated more than LT males.

where Y is Personal Benefits from Escalating

X is the Frequency of Performance Evaluation, (a dichotomous variable)

X = 1 for LT performance evaluation

2 for ST performance evaluation

H1 was supported if the mean of Perceived Benefits from Escalating in the LT was significantly less than the mean of Perceived Benefits from Escalating in the ST. The manner in which H1 was tested was dependent upon the treatment of the dependent variables. Personal Benefits from Escalating, Personal Benefits from Switching, Organizational Benefits from Escalating, and Organizational Benefits from Switching could either be tested separately or simultaneously. If tested separately, a t-test would be appropriate. If they were treated simultaneously a MANOVA (multivariate analysis of variance) would be appropriate. Because it is the univariate relationship between the Frequency of Performance Evaluation and Personal Benefits from Escalating that is of interest it was considered appropriate to conduct univariate tests (t-tests).

Ability to Manipulate One's Image H2

The following equation was developed for the purpose of testing Hypothesis 2:

$$Y = B_1 + B_2X + B_3M + B_4XM$$

where Y is Personal Benefits from Escalating

X is the Frequency of Performance Evaluation

M is the perceived Ability to Manipulate One's Image

XM is the interaction between the Frequency of Performance Evaluation and the perceived Ability to Manipulate One's Image

⁹In order to simplify the presentation of the equations, basic regression models are used. Technically, when conducting mean comparisons, the ANOVA model is more appropriate. For example, for H1 the ANOVA model would be: $X_{ij} = M + P_i + e_{ij}$, where X_{ij} is the observed response of subject number j ($j = 1, 2, \dots, n_i$) to treatment i ($i = 1, 2$), M is the superpopulation grand mean, P_i is the variance associated with treatment i , and e_{ij} is random error.

Multiple hierarchical regression was used to test H2.¹⁰ The interaction's significance was tested by determining whether the addition of the interaction term to the equation resulted in a significant increase in R^2 .

Doing the Job Right H3

The following equation was developed for the purpose of testing Hypotheses 3, 3a and 3b:

$$Y = B_1 + B_2X + B_3J + B_4XJ$$

where Y is Personal Benefits from Escalating

X is the Frequency of Performance Evaluation

J is consideration of Doing the Job Right

XJ is the interaction between the Frequency of Performance Evaluation and consideration of Doing the Job Right

Multiple hierarchical regression was used to test H3. The statistical significance of the interaction was tested by determining whether the addition of the interaction term to the equation resulted in a significant increase in R^2 (See Cohen and Cohen 1975 for a discussion of testing the significance of interactions).

Periods Until Switching H4

The following equations were developed for the purpose of testing H4a:

$$S = B_1 + B_2PBE$$

$$S = B_3 + B_4OBE$$

where S is the number of Periods Until Switching (three levels)

S = 1 if subject switched in Period 2

= 2 if subject switched in Period 3

¹⁰The question of univariate vs. multivariate analysis is also applicable in the supplementary analysis. If multivariate analyses were deemed necessary, the appropriate analyses would be canonical correlation or path analyses.

= 3 if subject never switched

PBE is Personal Benefits from Escalating

OBE is Organizational Benefits from Escalating

H4a is supported if the correlations between the number of Periods Until Switching and Personal Benefits from Escalating, and between the number of Periods Until Switching and Organizational Benefits from Escalating were positive and significantly different from zero.¹¹

The following equations were developed for the purpose of testing H4b:

$$S = B_1 + B_2PBS$$

$$S = B_3 + B_4OBS$$

where S is the number of Periods Until Switching (three levels)

S = 1 if subject switched in Period 2

= 2 if subject switched in Period 3

= 3 if subject never switched

PBS is Personal Benefits from Switching

OBS is Organizational Benefits from Switching

H4b was supported if the correlation between Periods Until Switching and Personal Benefits from Switching and between Periods Until Switching and Organizational Benefits from Switching were negative and significantly different from zero.

The appropriate analysis for hypotheses 4a and 4b was dependent upon the treatment of the independent variables. As discussed above univariate analysis was used (correlations).

¹¹Although this variable is not continuous, because there are three ordered levels, correlation analysis is considered appropriate for the analyses of H4a and H4b.

Summary

This chapter described the experiment designed to test the hypotheses developed in Chapter 3. An instrument was developed to measure cognitive processes underlying the investment decision. Subjects were given incentives to participate in the experiment.

The chapter also proposed data analysis methods to test the hypotheses. The results of these analyses are presented in Chapter 5.

CHAPTER 5 RESEARCH RESULTS

Introduction

This chapter reports the results of the analyses proposed in Chapter 4. First, data-screening methods, results of manipulation checks and analyses of nuisance variables are discussed. This is followed by a description of the methods used to develop scales for the measurement of Benefits, Aggression, and General Self-efficacy. Finally, the results of tests of the research hypotheses are presented.

Data Screening

In order to ensure the data conformed to basic standards, the frequencies of the data were analyzed for reasonableness. All variables were within acceptable ranges. Data screening revealed response errors by subjects. The types of errors and their resolutions are listed below:

1. Due to the complexity of the measurement of perceived benefits using the open-list, some subjects did not understand how to assign points among the four open-ended lists of perceived benefits. Six subjects applied 100 points to each of the lists; two distributed 25 points to each. Because the instructions were to distribute 100 points among all four lists as a reflection of the importance of the perceived benefits to their decision, it was apparent that these subjects did not understand the instructions. These measures therefore were treated as missing values.
2. Five subjects assigned weights which did not add to 100. The proportions of the assigned weights were multiplied by 100 with the resulting weights used in analysis.

3. Four subjects circled two responses for one statement on the fixed-list. The answers were coded as missing.

4. If a subject assigned fractional weights, anything equal to or less than x.5 was rounded down to x.

5. In two cases subjects said they "saw few benefits" or "I really don't see any benefits" in a specific category, yet still assigned weights to the overall category. These weights were retained in the analysis.

Manipulation Checks

Job Insecurity

Three statements on the post-experimental questionnaire addressed the success of the job insecurity manipulation. The results presented in Table 5-1 show that the manipulation was somewhat successful. Although only 31.2% disagreed or strongly disagreed with statement 2, "I felt secure in my job as Capital Procurement Manager," the manipulation appeared to be more successful when measured by statements 5 and 7. A majority (77%) of the subjects agreed or strongly agreed with statement 5, "Poor outcomes from my recommendations clearly would have meant losing the job of Acting Capital Procurement Manager." Furthermore, 66% agreed or strongly agreed with statement 7, "I needed to protect my position as Acting Capital Procurement Manager in the company."

Policy Resistance

Manipulation checks reported in Table 5-1 revealed that the policy resistance manipulation was moderately successful. First, a majority (54.1%) of subjects disagreed or strongly disagreed with statement 3, "The Board of Directors was supportive of my recommendations." Second, 49.6% of subjects agreed or strongly agreed with statement 6, "There was much resistance to my recommendations." Finally, a majority (67%) agreed

or strongly agreed with statement number 8, "The Board of Directors was reluctant to accept my recommendations."

Table 5-1
Responses to Manipulation Checks
Full Sample

		<u>Mean</u>	<u>SA (%)</u>	<u>A</u>	<u>N</u>	<u>D</u>	<u>SD</u>
1.	I felt pressure to "stick with" my original decision.	3.06	11.0	33.0	20.2	22.0	13.8
2.	I felt secure in my job as Capital Procurement Manager.	3.13	8.3	34.9	24.8	23.9	7.3
3.	The Board of Directors was supportive of my recommendations.	2.45	.9	15.6	29.4	35.8	18.3
4.	I cared what "grade" I was to receive on my performance evaluation.	3.94	32.1	45.0	11.9	7.3	3.7
5.	Poor outcomes from my recommendations clearly would have meant losing the job of Acting Capital Procurement Manager.	3.95	28.4	48.6	12.8	10.1	0
6.	There was much resistance to my recommendations.	3.44	8.3	41.3	36.7	13.8	0
7.	I needed to protect my position as Acting Capital Procurement Manager in the company.	3.63	12.8	53.2	18.3	12.8	1.8
8.	The Board of Directors was reluctant to accept my recommendations.	3.64	10.1	56.9	20.2	12.8	0
9.	During the experiment I acted as I thought best, not as I thought "Lee" or other managers might act.	4.32	57.8	25.7	10.1	3.7	2.8
10.	I wanted to perform well and make the best decisions I possibly could in this experiment.	4.54	60.6	34.9	3.7	0	.9
11.	My performance as Acting Capital Procurement Manager was evaluated annually.	3.45	22.9	37.6	13.8	12.8	12.8

Table 5-1--continued

		Mean	SA (%)	A	N	D	SD
12.	I looked back at my original list of consequences even though the instructions asked me not to do so (Please answer honestly, there is no penalty or reward for any answer).	1.37	0	4.6	3.7	15.6	75.2
13.	I found the format of the experiment (e.g., using the envelopes) understandable.	4.17	38.5	48.6	4.6	7.3	.9
14.	In general, when I do a job, I am more concerned about doing the job "right" than with how it will affect me, my bank account, my family, etc.	3.53	24.8	34.9	14.7	20.2	5.5
15.	I wanted to earn lottery tickets.	3.25	20.2	26.6	27.5	9.2	16.5
16.	I believed that the better my decisions, the more lottery tickets I would earn.	3.41	19.3	32.1	27.5	12.8	8.3

Note: Sample size was 109 for all questions except numbers 2, 7, and 12 which each had 108 subjects due to missing values.

Experimental Administration

Two statements in the post-experimental questionnaire presented in Table 5-1 measured procedural concerns with the experiment and revealed no apparent problems with the administration. Most (90.8%) of the subjects disagreed or strongly disagreed with statement 12, "I looked back at my original list of consequences even though the instructions asked me not to do so (Please answer honestly, there is no penalty or reward for any answer)." Furthermore, 87.1% of the subjects agreed or strongly agreed with statement 13, "I found the format of the experiment (e.g., using the envelopes) understandable."

Frequency of Performance Evaluation

Table 5-2 details responses to the post-experimental questionnaire for LT and ST subjects.¹ This analysis revealed four significant differences between the LT and ST

Table 5-2
Responses to Manipulation Checks
ST vs LT

		ST Mean	LT Mean	t	p
1.	I felt pressure to "stick with" my original decision.	3.30	2.79	2.18	.032
2.	I felt secure in my job as Capital Procurement Manager.	3.16	3.10	.30	.763
3.	The Board of Directors was supportive of my recommendations.	2.46	2.43	.16	.875
4.	I cared what "grade" I was to receive on my performance evaluation.	4.25	3.62	3.31	.001
5.	Poor outcomes from my recommendations clearly would have meant losing the job of Acting Capital Procurement Manager.	3.93	3.96	-.30	.764
6.	There was much resistance to my recommendations.	3.43	3.42	.31	.759
7.	I needed to protect my position as Acting Capital Procurement Manager in the company.	3.73	3.52	1.19	.238
8.	The Board of Directors was reluctant to accept my recommendations.	3.66	3.62	.24	.813
9.	During the experiment I acted as I thought best, not as I thought "Lee" or other managers might act.	4.55	4.08	2.59	.011

¹Additional analyses were conducted excluding all subjects who gave neutral answers to this question. This did not change the significance, or lack of significance, for any of the analyses. However, in the ANOVA analysis with Personal Benefits from Escalating reduced fixed-list as the dependent variable and the Frequency of Performance Evaluation as the independent variable, the marginal significance found in the original analysis ($p = .089$) was no longer apparent ($p = .238$).

Table 5-2--continued

		<u>ST Mean</u>	<u>LT Mean</u>	<u>t</u>	<u>p</u>
10.	I wanted to perform well and make the best decisions I possibly could in this experiment.	4.57	4.51	.49	.626
11.	My performance as Acting Capital Procurement Manager was evaluated annually.	4.30	2.55	9.25	.000
12.	I looked back at my original list of consequences even though the instructions asked me not to do so (Please answer honestly, there is no penalty or reward for any answer).	1.32	1.42	-.69	.495
13.	I found the format of the experiment (e.g., using the envelopes) understandable.	4.32	4.00	1.91	.058
14.	In general, when I do a job, I am more concerned about doing the job "right" than with how it will affect me, my bank account, my family, etc.	3.64	3.42	.97	.333
15.	I wanted to earn lottery tickets.	3.28	3.21	.30	.761
16.	I believed that the better my decisions, the more lottery tickets I would earn.	3.46	3.36	.47	.642

subjects. First, statement 1 showed that short-term subjects felt more pressure to "stick with" their original decision than did long-term subjects ($t=2.18$, $p=.032$). This provides support for the theory presented in Chapter 3 which was based on the idea that ST performance evaluation encourages escalation. Second, statement 4 revealed that short-term subjects cared more about what "grade" they would receive on their performance evaluations than did long-term subjects ($t=3.31$, $p=.001$). This difference indicates that the more often subjects were evaluated the greater their concern with the outcome of that evaluation. It is possible that since ST subjects received more evaluations that the outcome of these evaluations was more salient. Furthermore, statement 9 indicated that more short-term subjects than long-term subjects acted as they thought best, as opposed to how "Lee"

or other managers might act ($t=2.59$, $p=.011$). There is no apparent reason for this difference. Finally, statement 11 revealed that the subjects were aware of the timing of their performance evaluation. In response to the statement "My performance as Acting Capital Procurement Manager was evaluated annually" the mean for short-term subjects was significantly higher than the mean for long-term subjects ($t=9.25$, $p=.000$). These responses provided evidence that the subjects were at least aware of when their performance was evaluated. Although the reason for some differences between the two groups isn't entirely explainable, it is encouraging that the two groups responded differently to some measures. This provides evidence that in this study performance evaluation differentially affected cognitive processes.

Incentive system

Subjects were not required to attend the drawing to win and fewer than ten students attended. Furthermore, two students who won cash prizes did not claim the prizes. Because subjects had remained anonymous it was not possible to contact the winners who did not claim their prizes. The lack of interest in tickets and prizes was also evident in the response to measures which had been taken to ensure that subjects internalized the reward system. The post-experimental questionnaire included two statements, 15, "I wanted to earn lottery tickets" and 16, "I believed that the better my decisions, the more lottery tickets I would earn." The mean responses were 3.25 and 3.41 respectively on a scale of 1 (strongly disagree) to 5 (strongly agree). Only 46.8% agreed or strongly agreed with the first statement and only 51.4% agreed or strongly agreed with the second. Finally, the post-experimental questionnaire asked the subjects to estimate the tickets they expected to earn. Only 38 (35%) of the subjects understood how the tickets were awarded. The responses to the post-experimental questionnaire and the lack of participation in the final drawing indicate a general failure of the reward system to motivate self-interested behavior. This is addressed in the discussion of tests of Hypothesis 1.

Nuisance Variables

An examination of the correlations between possible nuisance variables (gender, GPA, age, major, experience, experimental session, and educational level) and the dependent and independent variables, did not reveal any significant correlations greater than .30. Supplemental analysis including nuisance variables was not considered necessary.

Missing Values

Additional analyses were performed that excluded subjects who had weighted benefits incorrectly (13 subjects), who had answered "very few benefits" (2 subjects), or who had failed to respond on the fixed-list or the open-list (8 subjects). This exclusion caused the main effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating open-list to become marginally significant ($p=.077$). It also changed the statistical significance of the main effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating reduced fixed-list, to $p=.109$. The results of the remainder of the analyses did not change from those found with the full sample.

A sample containing the twenty-three subjects whose values were excluded under the missing values analyses was compared to a sample of all other subjects. The means of each group for the Frequency of Performance Evaluation, GPA, age, major, experience, experimental session, and academic level were compared in order to determine whether there were any underlying differences between the two groups. The comparisons did not reveal any such differences.

Scales

As discussed in Chapter 4, the perceived Benefits from Escalating and Switching were elicited in two ways. First, subjects were asked to provide open-ended lists of benefits within the four categories presented by the personal-organizational and escalating-

switching dimensions. They were also asked to assign 100 points among all four lists to represent the extent to which they actually considered the benefits in making their choice.

Second, subjects were presented with two predetermined lists of benefits: benefits from switching and benefits from escalating. Seven personal and seven organizational benefits were mixed randomly within each list. Subjects were asked to rate the extent to which they considered each of the benefits in their decision by circling the number on a five-point scale (coded 1=not at all important, to 5=extremely important). Scale correlations for the two measures of perceived benefits are presented in Table 5-3.

Table 5-3
Scale Correlations

	OBEO	OBSO	PBEO	PBSO	OBEF	OBSF	PBEF	PBSF
OBEO	1.000	-.4913 [^]	-.0717	-.5027*	.4071*	-.1490	-.0361	-.2206**
OBSO		1.000	-.6147*	-.0574	-.3974*	.4708*	-.4716*	.0357
PBEO			1.000	-.2246 ^{^^}	.2053**	-.5455*	.4421*	-.2289**
PBSO				1.000	-.1835**	.1975**	.1736	.4735*
OBEF					1.000	.0530	.3514*	.0181
OBSF						1.000	-.0672	.6155*
PBEF							1.000	.4006 [^]
PBSF								1.000

* p <.01, 1-tailed significance

** p<.05, 1-tailed significance

[^] p<.01, 2-tailed significance

^{^^} p<.05, 2-tailed significance

Note:

PBEO	=	Personal Benefits from Escalating Open-List
PBSO	=	Personal Benefits from Switching Open-List
OBEO	=	Organizational Benefits from Escalating Open-List
OBSO	=	Organizational Benefits from Switching Open-List
PBEF	=	Personal Benefits from Escalating Fixed-List
PBSF	=	Personal Benefits from Switching Fixed-List
OBEF	=	Organizational Benefits from Escalating Fixed-List
OBSF	=	Organizational Benefits from Switching Fixed-List

Between-scale Convergent Validity

The between-scale correlations provide some information as to whether the two scales measure the same constructs. All between-scale correlations of different measures of the same constructs should be positive. For example, the open-list measure of Personal Benefits from Escalating should be positively correlated with the fixed-list measure of Personal Benefits from Escalating. The results of correlation analyses support these predictions. The convergent validity correlations for the two measures of perceived benefits (open and fixed lists) ranged from .4071 to .4735. All were significant at $p < .01$ indicating some convergent validity.

Reliability-fixed-list Scales

Each of the fixed-list scales is presented in Tables 5-4 through 5-7 with its respective coefficient of reliability, measured by Cronbach's alpha [Cronbach 1951]. The elimination of statements from scales measuring Organizational Benefits from Escalating, Organizational Benefits from Switching, or Personal Benefits from Switching did not improve the reported reliability. However, for the scale measuring Personal Benefits from Escalating, elimination of all statements except 4 and 5, improved the reliability to an alpha of .8812.²

The increase in reliability with the deletion of items 2, 6, 11, 12 and 14 points to a problem with the scale's measurement. An examination of the Personal Benefits from Escalating reveals that the scale, although measuring personal benefits, captures three different constructs. Items 2, 4, 5 and 14 relate specifically to an individual's image:

2. I would appear to have confidence in my decisions
and to be standing up for what I believe in.

²Cronbach's alpha provides an estimate of how well the measures of a trait in a scale agree. It represents "the average of all the possible split-half coefficients for a given test" [Cronbach 1951, p. 300].

Table 5-4
Fixed-List Measuring
Organizational Benefits from Escalating (alpha=.7617)

1. Mototronics would avoid the risk of incurring unexpected costs, unexpected production problems, etc.
3. Mototronics would not have to retrain any workers.
7. Mototronics would not have to stop production.
8. Mototronics would continue to produce XD3 at or under budget.
9. Mototronics would have no conversion costs.
10. Mototronics would not have an unbudgeted, extra cash outlay for the conversion in year two.
13. Mototronics would not have to lay off any workers.

Table 5-5
Fixed-List Measuring
Personal Benefits from Escalating
(Alpha all items=.8250 Alpha items 4 and 5=.8812)

2. I would appear to have confidence in my decisions and to be standing up for what I believe in.
4. I would not have to admit to the Board of Directors or my boss that my original choice was not the best, that I had made a "mistake."
5. I would not look like I couldn't make up my mind or that I was uncertain of my decisions.
6. I would receive acceptable performance evaluations and might become permanent Capital Procurement Manager.
11. I would avoid possible questions about my ethics for acting on "private" information.
12. I would avoid receiving an unacceptable performance evaluation and possible demotion.
14. I would appear to know what I was doing and as competent in my original decision process.

Table 5-6
Fixed-List Measuring
Organizational Benefits from Switching (alpha=.8311)

1. Mototronics' would save a lot of money and have higher profit.
2. Mototronics would produce XD3 significantly below budget.
3. Mototronics would get a jump on advanced technology, it would be on the "cutting edge."
7. Mototronics might be able to use the cost savings for other profitable ventures.
9. Mototronics would get a jump on competitors with the new production techniques.
12. Mototronics would decrease overall cash outflows.
13. Mototronics would improve its ability to attract outside investors due to the advanced technology and higher profits.

Table 5-7
Fixed-List Measuring
Personal Benefits from Switching (alpha=.8311)

4. I would please the Board of Directors since they were resistant to my original choice.
5. I would receive a better performance evaluation and might become permanent Capital Procurement Manager.
6. I would be perceived as having the confidence and flexibility to adapt to new information and to change to a better option.
8. I would look like a genius if it panned out and would be considered a hero.
10. I would appear to be doing the best thing for the company, and to be willing to put the company ahead of myself.
11. My reputation would not be harmed if the savings weren't recognized, because the beepers would still be produced efficiently.
14. I would please the Production Managers due to the decreased costs.

4. I would not have to admit to the Board of Directors or my boss that my original choice was not the best, that I had made a "mistake."
5. I would not look like I couldn't make up my mind or that I was uncertain of my decisions.
14. I would appear to know what I was doing and as competent in my original decision process.

Items 6 and 12 represent extrinsic benefits relating to performance:

6. I would receive acceptable performance evaluations and might become permanent Capital Procurement Manager.
12. I would avoid receiving an unacceptable performance evaluation and possible demotion.

Item 11 reflects the ethical consideration underlying the decision:³

11. I would avoid possible questions about my ethics for acting on "private" information.

In order to determine whether the scale does indeed represent these underlying dimensions, factor analysis was performed.⁴ As three dimensions were predicted, three factors were specified (Affifi and Clark 1984, p.334).⁵ The results of the factor analysis are presented in Table 5-8. After five iterations, items 2, 4, 5, and 14 loaded highly on

³The concern with ethics is included as a separate dimension rather than with the image dimension because it represents a different concept. The image dimension symbolizes how a person appears to others. The ethical dimension reflects an innate moral standard. This moral standard, or the inclination to make a moral choice, probably exists within some subjects regardless of any experimental treatment. The propensity to consider one's image, on the other hand, may be affected by external circumstances (in fact, it is this contention upon which this study is based). Another possible distinction between the two dimensions is that there is a difference between an image to others and an image to self. Statements 2, 4, 5, and 14 are associated with the external image while statement 11 is associated with the internal. It is the image to others with which this study is concerned.

⁴The same analyses were not performed for the remaining three scales (Organizational Benefits for Escalating, Personal Benefits for Switching, and Organizational Benefits for Switching) because these scales were only used to test Hypothesis 4. Tests of Hypothesis 4 were not sensitive to the underlying dimensions of the scales. Instead they were sensitive as to whether the scales measured benefits from switching or benefits from escalating.

⁵The alternative is to use the Kaiser criterion, choosing factors with eigenvalues greater than 1. Using eigenvalues greater than one resulted in 2 factors. Items 2, 4, 5, and 14 loaded heavily on Factor 1. Items 6 and 12 loaded heavily on Factor 2. Item 11 loaded heavier on Factor 2 (.51797) than Factor 1 (.11366).

Factor 1, 6 and 12 on Factor 2, and 11 on Factor 3. These loadings support the contention that the fixed-list scale measuring Perceived Benefits from Escalating captures three underlying constructs: image, economic and ethical.

Table 5-8
Factor Analysis for
Benefits from Escalating
Items 2,4,5,6,11,12,14

Final Statistics:

<u>Variable</u>	<u>Communality</u>		
PBEF2	.68221		
PBEF4	.76364		
PBEF5	.82808		
PBEF6	.85685		
PBEF11	.94057		
PBEF12	.89930		
PBEF14	.77601		
<u>Factor</u>	<u>Eigenvalue</u>	<u>Pct of Var</u>	<u>Cum Pct</u>
1	3.61349	51.6	51.6
2	1.20948	17.3	68.9
3	.92369	13.2	82.1

Varimax Converged in 5 iterations. Kaiser Normalization.

Rotated Factor Matrix:

	<u>Factor 1</u>	<u>Factor 2</u>	<u>Factor 3</u>
PBEF2	.70928	.18040	.38286
PBEF4	.85955	.15320	-.03658
PBEF5	.88287	.22019	-.01174
PBEF6	.37267	.84521	.05990
PBEF11	.09174	.12868	.95687
PBEF12	.08319	.93356	.14439
PBEF14	.85311	.14062	.16861

The theory discussed in Chapter 3 explained that the impact of performance evaluation occurs through its affect on an individual's need to present a positive image to others. Accordingly, it is probable that the impact of performance evaluation will be most apparent in the measurement of Personal Benefits from Escalating which reflects an

individual's concern with his or her image. Because of this, and based on the results of the reliability and factor analyses, hypotheses tests using Personal Benefits from Escalating fixed-list, used the full list and a reduced measurement (called reduced fixed-list) that included only items 2, 4, 5, and 14. The coefficient of reliability of this reduced scale is alpha = .8756.

Reliability-aggression Questionnaire

The reliability coefficient of the Aggression Questionnaire was alpha=.6047. The deletion of specific items did not result in improved reliability.

Reliability-efficacy Questionnaire

The reliability coefficient of the General Self-efficacy Questionnaire was alpha=.7966. The deletion of items did not result in improved reliability.

Tests of Hypotheses

This section repeats each of the hypotheses developed in Chapter 3 and presents the results of their tests. Since the model is based on the assumption that performance evaluation will affect escalation behavior, tests were conducted to ascertain whether this assumption held. Table 5-9 reports the switching behavior for long-term and short-term subjects.

Table 5-9
Switching Behavior

	ST	LT
Periods Until Switching	1	28 (50%) 33 (62%)
	2	6 (11%) 3 (6%)
	3	22 (39%) 17 (32%)

Of the long-term subjects, 62% switched immediately compared to only 50% of the short-term subjects. At the second opportunity to switch, 6% of the long-term subjects switched and 11% of the short-term subjects switched. More short-term subjects never switched (39%) than long-term subjects (32%). The results of ANOVA presented in Table 5-10 reveal that the Frequency of Evaluation is not significantly associated with Periods Until Switching ($F = 1.169$, $p = .141$).⁶

Table 5-10
Examination of the Effect of the Frequency of Performance Evaluation
on Periods Until Switching

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>p=</u>
Main Effects				
The Frequency of Performance Evaluation	1	1.033	1.169	.141*
Residual	107	94.527		
Total	108	95.560		

*1-tailed probability

However, eliminating the within cell variability by controlling for risk aversion changes the results.⁷ As Table 5-11 reports, the results of ANCOVA with risk aversion as

⁶It is not clear that using ANOVA for this data is proper since the dependent variable is ordinal with three levels: 1) switched in period 2; 2) switched in period 3; and 3) never switched. However, since the first two levels are continuous ANOVA is appropriate for an analysis using only these levels. If it can be established that the results of ANOVA using levels 1 and 2 are similar to the results using all three levels, then the applicability of ANOVA will be clearer. ANOVA using only levels 1 and 2 with Frequency of Evaluation as the independent variable and Periods Until Switching as the dependent variable are similar ($F = 1.341$, $p = .126$)

⁷The rationale underlying the use of risk aversion and concern with ethics as covariates is described in the results of hypothesis tests.

a covariate are significant ($F=8.263$, $p=.003$). Similar results are illustrated in Table 5-12 using subjects' concerns with ethics as a covariate ($F=7.809$, $p=.004$).

Based upon these analyses it appears that the Frequency of Performance Evaluation directly affects escalation behavior. This provides justification for exploring the links between the Frequency of Performance Evaluation and escalation behavior through the hypotheses developed in Chapter 3.

Table 5-11
Examination of the Effect of the Frequency of Performance Evaluation
on Periods Until Switching with Risk Aversion as a Covariate

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>p=</u>
Main Effects				
The Frequency of Performance Evaluation	1	.680	8.263	.003*
Covariate Risk	1	1.028	12.492	.000
Residual	65	5.350		
Total	67	7.059		

*1-tailed probability

Hypothesis 1

H1: Where there exists pressure to escalate commitment, the perceived Personal Benefits from Escalating will be greater when an individual is evaluated in the short run than when an individual is evaluated over the long run.

Table 5-13 presents the results of the t-tests using the open-list measure and the fixed-list measure of Personal Benefits from Escalating. They do not support predictions.

Table 5-12
Examination of the Effect of the Frequency of Performance Evaluation
on Personal Benefits from Escalating with Ethical Concerns as a Covariate
Reduced Fixed-List

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>p=</u>
Main Effects				
The Frequency of Performance Evaluation	1	.273	2.924	.046*
Covariate Ethics	1	.728	7.809	.092
Residual	65	6.058		
Total	67	7.059		

*1-tailed probability

For the open-list measure, the long-term mean and the short-term mean are 22 and 26 respectively and the difference is not statistically significant ($t = 1.02, p = .156$). For the fixed-list measures the long-term mean and the short-term means are 25 and 23 respectively, and the difference is not statistically significant ($t = 1.02, p = .155$). The reduced fixed-list t-test results are marginally significant. The long-term mean is 12, and the short-term mean is 13 ($t = 1.036, p = .089$).

Conceivably, the limited support for the first hypothesis could have been due to low power of the test to reject the null hypothesis, lack of psychometric reliability, failure of the experimental manipulations, a lack of subject motivation, difficulty with the experimental procedure, subjects' focus on confounding variables, or the hypothesis.

Assuming a medium effect size, with samples ranging from 96 to 100 subjects and a .05 significance level, the power for all tests was .79 or greater. Since this means that the

analyses had at least a 79% chance of rejecting the null hypothesis it is doubtful that lack of power explains the insignificance of the tests.

The second possible explanation for the insignificant results was a lack of psychometric reliability for the fixed-list scales. This is also a doubtful explanation since the full fixed-list of seven Personal Benefits from Escalating was highly reliable ($\alpha = .8250$). Furthermore, reliability was higher when the scale was reduced to statements 2, 4, 5 and 14 ($\alpha = .8756$). Factor analysis, specifying three factors, indicated that these four statements loaded highly on one of the factors. This factor appeared to measure benefits specifically related to one's image. Therefore, this reduced list of 4 statements, along with the full fixed-list and the open-list, was used in the analyses. Because both lists were highly reliable, it is doubtful that psychometric reliability was the cause of the insignificant results.

A third possible reason for the lack of support for Hypothesis 1 could be a failure of the manipulations. First, although statistically significant mean differences between the post-experimental questionnaire responses for long-term and short-term subjects were obtained for a number of questions, this may have indicated only that they were aware of the timing of their performance evaluation. The subjects may not have internalized the differences even though they were aware of them.

The lack of response to the incentive system is a fourth possible scapegoat. Manipulation checks in Table 5-1 revealed that 77.1% of the subjects agreed or strongly agreed with statement 4, "I cared what 'grade' I was to receive on my performance evaluation." The manipulation checks also showed that 83.5% agreed or strongly agreed with statement 9, "During the experiment I acted as I thought best, not as I thought 'Lee' or other managers might act." Furthermore, 95.5% strongly agreed or agreed with statement 10, "I wanted to perform well and make the best decisions I possibly could in this experiment." These findings suggest that the subjects performed to the best of their ability without a complete understanding of the incentive system. As subject 54 wrote, "I

Table 5-13
Results of t-tests
Hypothesis 1

t-test for: Personal Benefits from Escalating Open-list

	Number of <u>Cases</u>	<u>Mean</u>	Standard <u>Deviation</u>
Short-term	49	26.266	17.552
Long-term	49*	22.469	19.410

Pooled Variance Estimate

$t = 1.02$
 $df = 96$
 $p = .156$

T-test for: Personal Benefits from Escalating Fixed-list

	Number of <u>Cases</u>	<u>Mean</u>	Standard <u>Deviation</u>
Short-term	50	23.000	6.171
Long-term	49	21.714	6.334

Pooled Variance Estimate

$t = 1.02$
 $df = 97$
 $p = .155$

T-test for: Personal Benefits from Escalating Reduced Fixed-list

	Number of <u>Cases</u>	<u>Mean</u>	Standard <u>Deviation</u>
Short-term	51	13.255	4.088
Long-term	49	12.082	4.532

Pooled Variance Estimate

$t = 1.36$
 $df = 98$
 $p = .089$

*In this and other hypotheses tests the total number of cases does not equal the total sample size due to missing values.

wanted to make the best decisions possible. The lottery tickets are a nice incentive to participate but they really didn't influence me during the experiment." Subjects seem to have acted as though there was no external reward for their performance but nonetheless as though they were motivated to perform during the experiment.

It is possible that the students may not have been equally motivated to participate. MBA students, hereafter called Group 1, were "surprised" with the experiment during regular class time. They were permitted to stop at any time, but since their professor remained in the class during the experiment, some may have completed the experiment even though they did not wish to do so. On the other hand, the remaining subjects (hereafter called Group 2) were recruited during their classes and asked to participate in the experiment at another location outside of regular class time. The majority of these students received extra credit toward their grade for participation. Group 2 may have been more motivated than Group 1 and this differential motivation may have influenced the lack of results for the first hypothesis.

The results of t-tests for Hypothesis 1 revealed a difference between the groups. The students who participated outside of class (Group 2) appeared to be sensitive to the Frequency of Performance Evaluation for both the fixed-list and reduced-fixed-list measures of Personal Benefits from Escalating. Those in the ST condition perceived more Personal Benefits from Escalating (fixed-list 24.9, reduced fixed-list 14.6) than those in the LT condition (fixed list-21.8, reduced fixed-list 11.9). The differences were significant (fixed-list $t = 1.62$, $p = .057$, reduced fixed-list $t = 2.04$ $p = .0245$).⁸ On the other hand, for Group 1, no statistically significant differences were observed between LT and ST subjects with respect to the various measures of Personal Benefits from Escalating.

⁸The lack of significance using the open-list of Personal Benefits for Escalating may be due to the relative insensitivity of this measure. For example, some subjects listed items in this section which, if subjected to coding procedures, might be considered company benefits. It is possible that this may have muddied the results for this measure of Personal Benefits from Escalating.

The results of t-tests analyzing the relative motivation to participate in the experiment are presented in Table 5-14. There were no statistically significant differences

Table 5-14
Mean Differences
Experiments During Class (Group 1) and Experiments Outside of Class (Group 2)

		Mean <u>Group 1</u>	Mean <u>Group 2</u>	t =	p =
1.	I felt pressure to "stick with" my original decision.	2.97	3.16	-.79	.433
2.	I felt secure in my job as Capital Procurement Manager.	3.09	3.19	-.45	.657
3.	The Board of Directors was supportive of my recommendations.	2.48	2.40	.41	.680
4.	I cared what "grade" I was to receive on my performance evaluation.	3.92	4.00	-.38	.707
5.	Poor outcomes from my recommendations clearly would have meant losing the job of Acting Capital Procurement Manager.	4.00	3.88	.65	.519
6.	There was much resistance to my recommendations.	3.32	3.63	-1.88	.063
7.	I needed to protect my position as Acting Capital Procurement Manager in the company.	3.60	3.69	-.49	.627
8.	The Board of Directors was reluctant to accept my recommendations.	3.55	3.79	-1.45	.150
9.	During the experiment I acted as I thought best, not as I thought "Lee" or other managers might act.	1.34	4.28	.30	.762
10.	I wanted to perform well and make the best decisions I possibly could in this experiment.	4.55	4.53	.15	.443*
11.	My performance as Acting Capital Procurement Manager was evaluated annually.	3.46	3.44	.08	.940

Table 5-14--continued

		Mean Group 1	Mean Group 2	t =	p =
12.	I looked back at my original list of consequences even though the instructions asked me not to do so (Please answer honestly, there is no penalty or reward for any answer).	1.42	1.30	.75	.457
13.	I found the format of the experiment (e.g., using the envelopes) understandable.	4.08	4.28	-1.16	.249
14.	In general, when I do a job, I am more concerned about doing the job "right" than with how it will affect me, my bank account, my family, etc.	3.60	3.44	.65	.514
15.	I wanted to earn lottery tickets.	3.11	3.49	-1.46	.074*
16.	I believed that the better my decisions, the more lottery tickets I would earn.	3.35	3.56	-.89	.187*
17.	Gender	1.34	1.37	-.36	.723
18.	GPA	3.50	3.18	4.95	.000
19.	Experience	1.09	1.65	-7.50	.000
20.	Fixed-list, Benefits from Escalating, Statement 1: "Mototronics would avoid the risk of incurring unexpected costs, unexpected production problems, etc."	3.48	3.83	-1.62	.108
21.	Fixed-list, Benefits from Escalating, Statement 11: "I would avoid possible questions about my ethics for acting on "private" information."	2.57	3.37	-2.81	.006

*Because it was predicted that Group 2 was more motivated than Group 1, this p-value is based upon 1-tailed probabilities.

between the groups' desires to perform well or to make the best decisions they possibly could in the experiment. No differences were found with respect to caring what 'grade' they received on their performance evaluation or with respect to beliefs that the better the decisions, the more lottery tickets would be earned. A marginally significant difference ($t =$

-1.428 , $p = .074$) was found in the desire to earn lottery tickets. Group 1 had less desire to earn tickets than Group 2. Of Group 1, 41.5% agreed or strongly agreed that "I wanted to earn lottery tickets" while 55.8% of Group 2 agreed or strongly agreed with the statement.

The different reactions of Group 1 and Group 2 to the Frequency of Performance Evaluation could stem from other differences. The results of t-tests reported in Table 5-14 reveal that the groups differed on a number of measures. Group 2 perceived significantly more problems with the use of "private" information ($t = -2.81$, $p = .006$) than Group 1. Group 1 had higher GPA's ($t = 8.53$, $p = .000$) and more experience ($t = -7.50$, $p = .000$) than Group 2.⁹

It is possible that Group 2's lack of experience may account for its differential reaction to the Frequency of Performance Evaluation. On the other hand, this group also appeared to be affected more by the manipulations, to be more sensitive to ethical issues, and to be motivated more than Group 1. Additional research that equalizes the experimental setting across all subjects is needed, especially in order to separate the effects of motivation and experience.

A fifth possible explanation for the lack of support of Hypothesis 1 may have been the complexity of the experimental procedure. However, 87.1% agreed or strongly agreed that "I found the format of the experiment (e.g., using the envelopes) understandable."

An additional explanation for the lack of effect of the treatment is that subjects may have been influenced by variables other than the Frequency of Performance Evaluation. Two possible confounding variables were the perceived riskiness of the project and the ethical considerations surrounding the project.

A review of subjects' open-list answers indicated that some subjects considered the alternative project too risky. Because it was a new product which had not been

⁹The difference in GPA's is not necessarily informative since MBA students must maintain a 3.0 GPA and undergraduate accounting students must maintain a 2.8 GPA. Therefore it is not considered in the discussion.

introduced to the market, it appeared that some did not consider it a viable option. Individuals who considered the project as a viable option may have been less risk-averse. Therefore, it is possible that the variability associated with risk aversion may have affected the results of tests of hypothesis 1. As this is a post-hoc consideration, measures of the subjects' risk aversion were not available. However, the fixed-list did measure indirectly an individual's consideration of the riskiness. The first statement on the Benefits from Escalating fixed-list stated that "Mototronics would avoid the risk of incurring unexpected costs, unexpected production problems, etc." Using this rough measure of risk-aversion as a covariate and 1-tailed probabilities, ANCOVA (Table 5-15) revealed that

Table 5-15
Examination of the Effect of the Frequency of Performance Evaluation
on Personal Benefits from Escalating with Perceived Risk as a Covariate

Open-List

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>p=</u>
Main Effects				
The Frequency of Performance Evaluation	1	652.391	1.989	.081*
Covariate Risk	1	1388.861	4.235	.022
Residual	89	29186.574		
Total	91	31227.826		

Table 5-15--continued

Fixed-List

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>p=</u>
Main Effects				
The Frequency of Performance Evaluation	1	89.915	2.526	.058*
Covariate Risk	1	325.556	9.145	.003
Residual	96	3417.438		
Total	98	3832.909		

Reduced Fixed-List

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>p=</u>
Main Effects				
The Frequency of Performance Evaluation	1	62.093	3.614	.030*
Covariate Risk	1	127.211	7.405	.004
Residual	97	1666.457		
Total	99	1855.760		

*1-tailed probability

the Frequency of Performance Evaluation affected all three measures of Personal Benefits from Escalating, at least marginally, (open-list $F=1.989$, $p = .081$, fixed-list $F = 2.53$, $p = .058$, reduced fixed-list $F = 3.614$, $p = .03$). Apparently, reducing the within-cell

variability by controlling for risk aversion allowed the affect of the Frequency of Performance Evaluation to emerge.

Table 5-16

Examination of the Effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating with Ethical Concern as a Covariate

Open-List

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>p=</u>
Main Effects				
The Frequency of Performance Evaluation	1	486.996	1.855	.089*
Covariate Ethics	1	7379.861	28.116	.000
Residual	89	23360.969		
Total	91	31227.826		

Reduced Fixed-List

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>p=</u>
Main Effects				
The Frequency of Performance Evaluation	1	38.469	2.176	.072*
Covariate Risk	1	102.276	5.785	.009
Residual	97	1715.015		
Total	99	1855.760		

*1-tailed probability

Many subjects considered that the private information about the alternative was "inside" information, and questioned whether its use was legal or ethical. The fixed-list measured an individual's consideration of the ethical nature of the choice. The eleventh statement on the Benefits from Escalating fixed-list stated that "I would avoid possible questions about my ethics for acting on 'private' information." The results of ANCOVA using statement 11 as a covariate for the effects of the Frequency of Performance Evaluation on the open-list and reduced fixed-list measures and 1-tailed probabilities are presented in Table 5-16.¹⁰ These tests revealed that the Frequency of Performance Evaluation marginally affected both measures of Personal Benefits from Escalating (open-list $F=1.855$, $p = .089$, reduced fixed-list $F = 2.176$, $p = .072$). As with subjects' risk-aversion, reducing the within-cell variability by controlling for concern with ethics allowed the effect of the Frequency of Performance Evaluation to emerge.

Hypothesis 2

H2: Where there exists pressure to escalate commitment, there is an interaction between the Frequency of Performance Evaluation and the perceived Ability to Manipulate One's Image affecting Personal Benefits from Escalating.

The interaction is such that the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating becomes stronger as the perceived Ability to Manipulate One's Image becomes greater.

Recall that the construct of the perceived Ability to Manipulate One's Image to others was measured using two personality measures--Aggression and General Self-efficacy.

The results of the hierarchical regression with Aggression as the moderating variable, and Personal Benefits from Escalating open-list as the independent variable, are

¹⁰Because statement 11 also was part of the fixed-list measure of Personal Benefits from Escalating, it could not be used as a covariate for the effect of the Frequency of Performance Evaluation on the full fixed-list.

presented in Table 5-17.¹¹ As the significance test indicates, the addition of the interaction between the Frequency of Performance Evaluation and Aggression does not add to the R^2 . The results of the hierarchical regression analysis with Aggression as the moderating variable and Personal Benefits from Escalating, fixed-list, as the independent variable are presented in Table 5-18. As the significance test indicates, the addition of the interaction of the Frequency of Performance Evaluation and Aggression does not add significantly to the R^2 . Finally, the results for the same tests using Personal Benefits from Escalating reduced fixed-list as a measure of Personal Benefits from Escalating also are insignificant. They are presented in Table 5-19.

The results of the analyses using General Self-efficacy as a measure of the construct of the perceived Ability to Manipulate One's Image to others resulted in similarly insignificant results. These results are presented in Tables 5-20 through 5-22.

Hypothesis 3

H3: Where there exists pressure to escalate commitment, there is an interaction between the Frequency of Performance Evaluation and an individual's consideration of Doing the Job Right, affecting Personal Benefits from Escalating.

The interaction is such that the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating becomes stronger the less the individual considers Doing the Job Right.

The results of the multiple regression analysis are presented in Tables 5-23 through 5-25. As the significance tests indicate, the addition of the interaction between the Frequency of Performance Evaluation and Doing the Job Right did not improve the equation's explained variance.

¹¹For H2 and H3, the results of the hierarchical regression are presented first. This is followed by significance tests which determine whether the addition of the interaction to the regression equation which contained only the main effects, results in a significant increase in R^2 .

Table 5-17
 Results of Multiple Regression Analysis
 Dependent Variable Personal Benefits from Escalating
 Open-List

<u>Variable</u>	<u>Beta</u>	T	<u>Sig T</u>
Aggression	.207222	2.076	.0406
Frequency	-.100727	-1.009	.3155
(Constant)		-.197	.8443
$R^2^* = .03364$			

<u>Variable</u>	<u>Beta</u>	T	<u>Sig T</u>
AggXFreq	1.002741	1.081	.2826
Aggression	-.103714	-.341	.7342
Frequency	-1.051466	-1.188	.2380
(Constant)		.945	.3470
$R^2 = .03534$			

Significance Test

Independent Variables:	R2	Incremental R2	F
Aggression + Frequency	.0336		
Aggression + Freq + AggXFreq	.0353	.0017	0.05

n = 98

Table 5-18
 Results of Multiple Regression Analysis
 Dependent Variable Personal Benefits from Escalating
 Fixed-List

<u>Variable</u>	<u>Beta</u>	T	<u>Sig T</u>
Aggression	-.090335	-.893	.3738
Frequency	-.102222	-1.011	.3145
(Constant)		5.065	.0000
$R^2 = .00161$			

<u>Variable</u>	<u>Beta</u>	T	<u>Sig T</u>
AggXFreq	.952958	1.020	.3102
Aggression	-.388959	-1.256	.2121
Frequency	-.997695	-1.129	.2616
(Constant)		2.702	.0082
$R^2 = .00118$			

Significance Test

Independent Variables:	R2	Incremental		F
		R2		
Aggression + Frequency	-.0016			
Aggression + Freq + AggXFreq	-.0012	.0004		0.01

n = 99

Table 5-19
 Results of Multiple Regression Analysis
 Dependent Variable Personal Benefits from Escalating
 Reduced Fixed-List

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
Aggression	-.052495	-.523	.6024
Frequency	-.136323	-1.357	.1779
(Constant)		4.142	.0001
$R^2 = .00111$			

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
AggXFreq	.454784	.492	.6241
Aggression	-.195431	-.635	.5269
Frequency	-.565672	-.643	.5215
(Constant)		1.892	.0615
$R^2 = -.00676$			

Significance Test

Independent Variables:	Incremental		
	R2	R2	F
Aggression + Frequency	.0011		
Aggression + Freq + AggXFreq	-.0068	-.0079	-0.24

n = 100

*The R2's used in the hierarchical regression analyses are adjusted R2's.

Table 5-20
 Results of Multiple Regression Analysis
 Dependent Variable Personal Benefits from Escalating
 Open-List

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
Efficacy	-.099247	-1.052	.2956
Frequency	-.108487	-1.052	.3384
(Constant)		2.531	.0131
<u>R2=.00086</u>			

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
EffXFreq	1.934470	1.895	.0613
Efficacy	-.669867	-2.107	.0378
Frequency	-1.933575	-1.996	.0489
(Constant)		2.643	.0097
<u>R2=.02823</u>			

Significance Test

Independent Variables:	R2	Incremental R2	F
Efficacy + Frequency	.0009		
Efficacy + Freq + EffXFreq	.0282	.0274	0.83

n = 95

Table 5-21
 Results of Multiple Regression Analysis
 Dependent Variable Personal Benefits from Escalating
 Fixed-List

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
Efficacy	-.105586	-.1.029	.3064
Frequency	-.110932	-.1.081	.2827
(Constant)		4.912	.0000
$R^2 = .00127$			

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
EffXFreq	-.1.294459	-.1.321	.1899
Efficacy	.284813	.911	.3649
Frequency	1.135284	1.196	.2347
(Constant)		.476	.6349
$R^2 = .00920$			

Significance Test

Independent Variables:	R2	Incremental R2	F
Efficacy + Frequency	.0013		
Efficacy + Freq + EffXFreq	.0092	.0079	0.24

n = 96

Table 5-22
 Results of Multiple Regression Analysis
 Dependent Variable Personal Benefits from Escalating
 Reduced Fixed-List

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
Efficacy	-.048664	-.476	.6353
Frequency	-.132679	-1.297	.1976
(Constant)		3.750	.0003
$R^2 = -.00152$			

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
EffXFreq	-.2.245310	-2.333	.0218
Efficacy	.625217	2.046	.0436
Frequency	2.029316	2.177	.0320
(Constant)		-.854	.3950
$R^2 = .04368$			

Significance Test

Independent Variables:	R2	Incremental		F
		R2	R2	
Efficacy + Frequency			-.0015	
Efficacy + Freq + EffXFreq	.0437	.0452		1.44

n = 97

Table 5-23
 Results of Multiple Regression Analysis
 Dependent Variable Personal Benefits from Escalating
 Open-List

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
JOBRITE	-.340264	-3.494	.0007
Frequency	-.158776	-1.631	.1063
(Constant)		6.177	.0000
R2=.10485			

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
JOBRITEExFreq	-.196401	-.497	.6202
JOBRITE	-.193719	-.624	.5342
Frequency	-.010800	-.034	.9726
(Constant)		2.328	.0000
R2=.09770			

Significance Test

Independent Variables:	R2	Incremental R2	F
JOBRITE + Frequency		.1049	
JOBRITE + Freq + JOBRITEExFreq	.0977	-.0072	-0.22

n =98

Table 5-24
 Results of Multiple Regression Analysis
 Dependent Variable Personal Benefits from Escalating
 Fixed-List

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
JOBRITE	-.437447	-4.756	.0000
Frequency	-.155409	-1.690	.0944
(Constant)		12.800	.0000
R2=.18264			

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
JOBRITExFreq	-.057104	-.153	.8784
JOBRITE	-.395457	-1.369	.1743
Frequency	-.114015	-.400	.6903
(Constant)		2.328	.0000
R2=.17424			

Significance Test

Independent Variables:	R2	Incremental R2	F
JOBRITE + Frequency		.1826	
JOBRITE + Freq + JOBRITExFreq	.1742	-.0084	-0.26

n = 99

Table 5-25
Results of Multiple Regression Analysis
Dependent Variable Personal Benefits from Escalating
Reduced Fixed-List

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
JOBRITE	-.372245	-3.963	.0001
Frequency	-.178496	-1.900	.0604
(Constant)		10.752	.0000
R2=.13789			

<u>Variable</u>	<u>Beta</u>	<u>T</u>	<u>Sig T</u>
JOBRITEExFreq	-.181116	-.475	.6356
JOBRITE	-.239634	-.814	.4178
Frequency	-.047390	-.163	.8712
(Constant)		4.490	.0000
R2=.13096			

Significance Test

Independent Variables:	R2	Incremental R2	F
JOBRITE + Frequency	.1379		
JOBRITE + Freq + JOBRITEExFreq	.1310	-.0069	-0.22

n = 100

Hypothesis 4a

H4a: Where there exists pressure to escalate commitment, there will be two positive correlations: 1) between Personal Benefits from Escalating and Periods Until Switching, and 2) between Organizational Benefits from Escalating and Periods Until Switching.

The correlations between the number of Periods Until Switching and Benefits from Escalating, and between the number of Periods Until Switching and Benefits from Switching, are reported in Table 5-26. Personal and Organizational Benefits from Escalating Open-list both are correlated significantly and positively with the number of Periods Until Switching (Personal: $r = .5827$ $p = .000$, Organizational: $r = .5160$, $p =$

Table 5-26
 Hypothesis 4
 Correlations Between Benefits and
 Periods Until Switching

Panel A: Open-List

	Personal Benefits From <u>Escalating</u>	Organizational Benefits From <u>Escalating</u>	Organizational Benefits From <u>Switching</u>	Personal Benefits From <u>Switching</u>
Periods Until Switching	.5827*	.5160*	-.4108*	-.6624*

Panel B: Fixed List, all items

	Personal Benefits From <u>Escalating</u>	Organizational Benefits From <u>Escalating</u>	Organizational Benefits From <u>Switching</u>	Personal Benefits From <u>Switching</u>
Periods Until Switching	.3372*	.3898*	-.4148*	-.2888*

Panel C: Fixed List, Reduced Items

	Personal Benefits From <u>Escalating</u>
Periods Until Switching	.2958*

* $p < .01$

.000). Results for the fixed-list also are significant and in the predicted direction (Personal: $r = .3372$ $p = .000$, Organizational: $r = .3898$, $p = .000$). Finally, Personal Benefits from Escalating, reduced fixed-list, and the number of Periods Until Switching are correlated significantly and positively ($r = .2958$, $p = .001$).

Hypothesis 4b

H4b: Where there exists pressure to escalate commitment, there will be two negative correlations: 1) between Personal Benefits from Switching and Periods Until Switching, and 2) between Organizational Benefits from Switching and Periods Until Switching.

These predictions were supported and their results are presented in Table 5-26. Personal and Organizational Benefits from Switching open-list are correlated negatively and significantly with the number of Periods Until Switching (Personal: $r = -.6624$ $p = .000$, Organizational: $r = -.4108$, $p = .000$). The correlation between Personal Benefits from Switching, fixed-list, and the number of Periods Until Switching is significant ($r = -.2888$, $p = .002$) as is correlation between Organizational Benefits from Switching, fixed-list, and the number of Periods Until Switching ($r = -.4148$, $p = .000$).

Exploratory Analysis of Hypothesis 1

A closer look at the four statements comprising the reduced fixed-list revealed that although the statements are associated with the image of an individual, they actually represent two types of benefits. Statements 4 and 5 represent avoiding embarrassment.

4. I would not have to admit to the Board of Directors or my boss that my original choice was not the best, that I had made a "mistake."
5. I would not look like I couldn't make up my mind or that I was uncertain of my decisions.

Statements 2 and 14, on the other hand, represent receiving positive benefits affecting one's image.

2. I would appear to have confidence in my decisions and to be standing up for what I believe in.
14. I would appear to know what I was doing and as competent in my original decision process.

The factor analysis reported in Table 5-28 is consistent with these propositions. The addition of a fourth factor causes the "image" factor to divide into two factors: Factor 1 (statements 4 and 5) and Factor 3 (statements 2 and 14). Analyzing Hypothesis 1 with a

Table 5-28
 Factor Analysis for
 Benefits from Escalating
 Items 2,4,5,6,11,12,14
 with 4 Factors Specified

Final Statistics:

<u>Variable</u>	<u>Communality</u>		
PBEF2	.90665		
PBEF4	.91164		
PBEF5	.87150		
PBEF6	.89050		
PBEF11	.99199		
PBEF12	.91870		
PBEF14	.80397		
<u>Factor</u>	<u>Eigenvalue</u>	<u>Pct of Var</u>	<u>Cum Pct</u>
1	3.61349	51.6	51.6
2	1.20948	17.3	68.9
3	.92369	13.2	82.1
4	.54830	7.8	89.9

Varimax Converged in 5 iterations. Kaiser Normalization.

Rotated Factor Matrix:

	<u>Factor 1</u>	<u>Factor 2</u>	<u>Factor 3</u>	<u>Factor 4</u>
PBEF2	.27582	.17043	.87618	.18393
PBEF4	.92674	.14063	.17192	.05889
PBEF5	.84800	.20758	.32969	.02481
PBEF6	.21084	.84017	.37413	-.01361
PBEF11	.05402	.12414	.15040	.97521
PBEF12	.13328	.93161	-.01386	.18124
PBEF14	.59238	.12867	.65642	.07495

scale of only statements 4 and 5 (alpha = .8812) resulted in a significant mean difference between the mean Perceived Benefits from Escalating in the long-term (5.08) and the short-term (6.21) conditions ($t=2.36$, $p=.01$). Tests of Hypothesis 1 with a scale of statements 2 and 14 revealed no mean differences (LT-7.00, ST-7.00, $t = 0$). This may explain why the Frequency of Performance Evaluation did not affect the open-list, fixed-list or reduced fixed-list measures of Personal Benefits from Escalating. These results are consistent with

the view that the Frequency of Performance Evaluation affects a person's consideration of the avoidance of negative consequences from switching.

Summary

The predictions for the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating were not supported strongly. One measure of Personal Benefits from Escalating, the reduced fixed-list, weakly supported this prediction. The results were strengthened with supplementary analyses. Neither an individual's consideration of doing the job "right" nor the perceived Ability to Manipulate One's Image to others moderated the relationship between the Frequency of Performance Evaluation and Personal Benefits from Escalating. The predicted relationships between Perceived Benefits and the number of Periods Until Switching were supported strongly. Discussions of these findings are presented in Chapter 6.

CHAPTER 6 SUMMARY AND CONCLUSIONS

Summary and Discussion of the Results

This study posed three major questions. Does the Frequency of Performance Evaluation affect an individual's perception of the benefits of a decision? Is the relationship between the Frequency of Performance Evaluation and Personal Benefits from Escalating moderated by variables such as the perceived Ability to Manipulate One's Image to others? Do the perceived benefits weighted most heavily by subjects explain the actions taken? This section summarizes and discusses the results of tests conducted to investigate these questions.

Frequency of Performance Evaluation

The results of t-tests showed that whether an individual was evaluated in the short run or in the long run did not strongly affect the perceived Personal Benefits from Escalating. This was true for all three measures of personal benefits: open-list, fixed-list, and reduced fixed-list. The Frequency of Performance Evaluation weakly affected the Personal Benefits from Escalating measured with the reduced fixed-list.

Further analyses revealed that the Frequency of Performance Evaluation affected the perceived Personal Benefits from Escalating for those subjects who participated outside of regular class time. Subjects who participated in class were not influenced by the manipulation. It was not clear whether these differences were due to differences in work experience or other factors.

Reducing the within-cell variability by controlling for risk aversion or concern with ethics improved the test results of Hypothesis 1. ANCOVA showed that the Frequency of

Performance Evaluation at least marginally affected Personal Benefits from Escalating using considerations of risk or concern with ethics as covariates.

Finally, exploratory analyses showed that the Frequency of Performance Evaluation affected an isolated subset of Personal Benefits from Escalating, that represented the avoidance of embarrassment from switching. Subjects evaluated in the short-term condition perceived significantly more of these benefits than those in the long-term condition.

Ability to Manipulate One's Image

Hierarchical multiple regression analysis revealed that the perceived Ability to Manipulate One's Image did not moderate the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating. This conclusion applied for all measures of Personal Benefits from Escalating and for both measures (Aggression and General Self-efficacy) of a perceived Ability to Manipulate One's Image.

Doing the Job Right

The results of hierarchical multiple regression analysis revealed that a person's concern with Doing the Job Right did not moderate the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating.

The exploratory analyses of Hypothesis 1 indicated that the Frequency of Performance Evaluation affected an individual's perception of the ability to avoid negative repercussions for switching. Therefore, it is not surprising that neither the Ability to Manipulate One's Image to others nor consideration of Doing the Job Right moderated the relationship between the Frequency of Performance Evaluation and Personal Benefits from Escalating. A more appropriate moderating variable might have been one which captured an individual's need to avoid criticism, and this may be worthy of future research attention.

Periods Until Switching and Benefits from Escalating

Correlation analysis revealed that all Benefits from Escalating, Personal and Organizational, were positively correlated with the number of Periods Until Switching. This indicated that the longer an individual escalated, the more Benefits from Escalating were reported.

Periods Until Switching and Benefits from Switching

The results of correlation analysis also showed that all Benefits from Switching, Personal and Organizational, were negatively correlated with the number of Periods Until Switching. The sooner an individual switched, the more Benefits from Switching were reported.

Limitations

As discussed in Chapter 4, the use of student subjects restricts the generalizability of the results to the population of interest--corporate managers. However, in isolating the psychological variables of interest in this decision task, the first step was to examine whether the choices of a homogeneous group of subjects, such as students, support the predicted results.

Generalizability is also limited, due to the necessary simplification of the task. While the measurement of the effects of performance evaluation extends prior research, the present study does not consider all possible investment alternatives which might be available to managers. This study also does not consider the effect information search might have on the decision process. Forcing individuals to make a choice between two alternatives and providing the individuals with complete information may result in responses that do not represent the decision processes which would occur in a more realistic situation. Furthermore, many subjects indicated that the information was insufficient to allow a reasonable judgment.

As discussed in Chapter 4, the measurement of perceived benefits necessarily involves several limitations. The retrospective elicitation of Perceived Benefits may have affected the responses of subjects. Furthermore, the use of written probes may have directed subjects to provide information they felt was desired by the experimenter. However, the use of two types of probes (open and fixed-lists) may have alleviated some of the limitations associated with each type of probe.

Finally, this study considers the possible benefits of a long-term performance evaluation system relative to short-term, without considering the costs of such a system. The information requirements of a long-term accounting-based performance measure might be a constraining factor.

Implications and Conclusions

This research adds to the body of accounting-based performance measures literature because it is the first to offer and to test explicit hypotheses concerning the cognitive processes underlying an individual's reaction to accounting-based performance measures. Prior research regarding the dysfunctional consequences of accounting-based performance measures has concentrated on the consequences rather than the determinants of dysfunctional behavior [Hopwood 1974]. This study provides a deeper understanding of the underlying processes leading to one type of dysfunctional behavior. Specifically, it provides an explicit examination of the effects of the Frequency of Performance Evaluation on decision making. Using self-reports as data, the determinants of capital-budgeting decisions were measured, as well as the impact of performance evaluation on each of these determinants.

Conclusions

General answers to the three major questions asked in this study are presented in this section. This is followed by a discussion of the implications for the model, for future research and for policy-makers.

The first question asked whether the Frequency of Performance Evaluation affects an individual's perception of the benefits of that decision. The results suggest that how often a person is evaluated affects some of the consequences which the individual considers as a result of his or her decisions. In the short-term condition, the prospect of embarrassment from switching was more salient than in the long-term condition. This occurs because the long-term performance evaluation acts as an agreement by the organization to ignore interim information and concentrate on the overall outcome. This makes it possible for the individual to focus on the economic benefits to the organization rather than on any damage to his or her image. Short-term performance evaluation, on the other hand, directs an individual to consider the negative personal repercussions from switching because the organization will also implicitly consider these outcomes in the annual performance evaluation.

The second question asked whether the relationship between performance evaluation and Personal Benefits from Escalating was moderated by the perceived Ability to Manipulate One's Image to others, or by a person's attitude toward Doing the Job Right. In this study, these variables did not affect the relationship. However, a person's attitude toward Doing the Job Right directly affected certain types of benefits. Individuals who considered personal benefits before Doing the Job Right perceived more Personal Benefits from Escalating. On the other hand, those who put Doing the Job Right ahead of their own welfare, perceived more Organizational Benefits from Switching.

Finally, the third question asked whether the perceived benefits which a subject weighted most heavily, explained the action taken. The results supported this contention.

Subjects who escalated weighted more benefits from escalating. Conversely, subjects who switched weighted more benefits from switching.

Implications for the Model

The original model predicted that the Frequency of Performance Evaluation would affect Personal Benefits from Escalating. The results of this study reveal that this relationship is weakly supported and strongly supported only after the within-cell variability associated with risk aversion or concern for ethics is reduced. However, performance evaluation strongly affects a subset of Personal Benefits from Escalating, which suggests a needed refinement of the model. The refinement entails dividing Personal Benefits from Escalating into four categories: 1) positive benefits affecting one's image; 2) benefits of avoiding embarrassment from switching; 3) extrinsic benefits related to performance; and 4) benefits reflecting the ethical consideration underlying the decision. Of these, the Frequency of Performance Evaluation appears to effect only the second.

Implications for Future Research

Implications for future research arise in several areas:

1. While using an investment choice as the decision context was not expected to affect the results, further research should extend the potential for similar results to occur with other management decisions. Another extension of this research would be to examine the effect of including the results of other decisions in the performance evaluation.
2. In future research, concern with risk, ethics and Doing the Job Right should be measured with scales which have been tested for reliability.
3. An improved experimental design is needed in future research. During the current experiment, subjects' decisions may have been affected by variables other than the issues of interest in the study. For example, some subjects were very concerned with the worker lay-offs if the alternative were purchased (there was no mention of such lay-offs in

the experimental materials). Furthermore, some subjects were confused as to where production would take place. Still others complained that there was not enough time. Clarification of these issues might remove some bias and clarify the effect of the Frequency of Performance Evaluation on Personal Benefits from Escalating.

4. Use of a single experimental setting would also improve the ability to eliminate the measurement problems associated with the present experiment. In the present study it was not possible to separate the effects of subject motivation from subject work-experience.

5. Since this study indicated that performance evaluation affected an individual's perception of the negative repercussions from switching, future research would benefit from an improved measurement of these repercussions. The present scale, although highly reliable, contains only two statements which measure the avoidance of embarrassment. A scale with more statements reflecting negative repercussions from switching should strengthen the link between the Frequency of Performance Evaluation and the perceived Personal Benefits from Escalating.

6. Future research could benefit from the application of an interactive computer-program. This would make it possible to provide more information with more alternatives. Furthermore, it would include the costs of using the information because the subject would be forced to "pay" for the information with the time spent searching and processing. This method would also allow subjects to work at their own pace.

Implications for Policy Makers

Generalizations of the results of this study to policy makers must be made with care given the limitations of the study and the need for future research. It appears that employers can use performance evaluation to manipulate goal congruence. With the availability of a descriptive model for the effects of long-term/short-term performance evaluation, managerial accounting systems and reports may be designed to minimize

escalation errors and other dysfunctional behaviors which may result from the use of accounting-based performance measures.

Because individuals who considered Personal Benefits before they considered Doing the Job Right perceived more Personal Benefits from Escalating it appears that escalation errors emanate from a tendency to consider personal outcomes. It is therefore in the best interests of an organization to attempt to align personal and organizational benefits in order to prevent such behavior. The use of performance evaluation to influence such congruency has been shown to be effective for a specific subset of Personal Benefits from Escalating. Particularly, long-term performance evaluation allows individuals to direct their focus away from the negative repercussions associated with switching.

While long-term performance evaluation directed subjects' attention away from the negative repercussions from switching, short-term performance evaluation also had some beneficial consequences. Short-term subjects seemed to pay more attention to the experiment, they understood the format of the experiment more and they acted as they thought best more than the long-term subjects. Perhaps those in the long-term condition felt more relaxed and were less attentive than those in the short-term. Therefore, it appears that there may be tradeoffs involved with the use of either type of performance evaluation. Because certain features of each type of performance evaluation may have beneficial repercussions, companies might benefit by using a combination of the two types of performance evaluation. Major companies compensate executives with combinations of compensation packages which include salary, variable compensation and long-term performance programs [Edman 1990]. Similar combinations for lower-level managers might overcome some of the dysfunctional consequences of short-term performance evaluation while retaining the benefits.

APPENDIX EXPERIMENTAL MATERIALS

The materials presented in this appendix are those which would have been used by a subject assigned to LT treatment who chose Machine 0036 during the first period and who chose to "stick with" this machine during the remaining periods. The materials are presented in the following order: (1) Scenario; (2) Instructions; (3) Rules for Earning Tickets; (3) Period 1 Experimental Materials; (4) Period 2 Experimental Materials; (5) Period 3 Experimental Materials; (6) Period 4 Experimental Materials; (7) Post-Experimental Questionnaire; (8) Aggression Questionnaire; and (9) General Self-Efficacy Questionnaire.

Scenario

Overview

This case is concerned with managerial decision making. You will be asked to assume the role of Lee Chambers, Capital Procurement Manager for the Paging Division of Mototronics, Inc. Mototronics is an international, technologically advanced electronics corporation. The Paging Division of Mototronics has approximately 2100 non-unionized employees and produces beepers in Boynton Beach, Florida. Mototronics is the world's largest pager producer.

Situation

The position of Capital Procurement Manager is a new position in the company. Many of your responsibilities were previously assigned to the production managers before being consolidated in your present position. You have been with Mototronics for 10 years; the experience has been mostly successful and satisfying. You are happy to have received this significant promotion and want to keep it.

Unfortunately, you have only been temporarily assigned to fill the position (your official title is Acting Capital Procurement Manager). A complete evaluation of the reorganization which resulted in your promotion will occur within the next five years and your job will become permanent or you will be demoted back to Production Manager, depending on your performance. There is some uncertainty as to whether your former position will still be available because of the current recession and rising unemployment. In the meantime, you have to deal with other executives who are well-qualified and envious of your position. Indeed, they were unhappy that you were chosen over them to fill the temporary position. Thus, you cannot expect support and assistance from your peers, especially if you do not perform well immediately.

You begin your first day as Capital Procurement Manager on January 2, 1992. You are confronted with various situations in your new position which will be described in memos from fellow employees.

Instructions

Your task is to make a series of decisions concerning the investment of organizational funds. However, the case recognizes that good management decisions frequently involve much more than the ability to evaluate financial information and economic conditions. On occasion, relationships with other organizational members such as superiors, peers, and subordinates must be considered along with other elements.

As mentioned, you will be asked to make a series of funding decisions in the case. There is ample information contained in the case to make high quality decisions. You will receive a performance evaluation on the degree of success or failure of your decisions. This evaluation will be based on your reactions to the situations described in the case and will account for a wide variety of information: cost attainment and relationships between the principal actors in the case, to name a few. All of these factors are important determinants of the success of your investments and should be considered. Successful managerial decision making requires skill at knowing what information to attend to and how to interpret it correctly.

You are to work independently. Begin working with the papers attached to the envelopes. Removing the paper clip and setting aside future year's envelopes will make your analysis easier. Each "year" you are to go through the packet of papers in chronological order, taking whatever action you think appropriate. You may look back at previously completed pages unless otherwise noted, but do not change the responses. Write directly on each memo or report, noting every action you take, including notes to your subordinates, yourself, and others. Keep in mind that your ideas and actions cannot be evaluated unless you write them down. Do not just say what you would do in the situation, but actually write the thoughts that preceded your decisions.

At the end of each year a bell will ring. However there should be no time pressure, ample time is allotted to complete each year's task so take your time. When the bell rings, paper clip the current papers and begin the next packet. Choose the packet which reflects the choices you made in the previous year. For example, if you chose machine 0036 in year one, choose the packet for the next year with "0036" written on the front. Do not start the next packet until the year is over, i.e., the bell rings. If you finish early review your work. Do not look at any other materials.

Rules for Earning Tickets

The bottom right-hand corner of this page contains your subject number. Keep this page, you will use it to collect your tickets. After your responses and decisions have been analyzed, you will be allotted tickets. The number of tickets you receive will be based upon your success as Capital Procurement Manager:

1. How well you respond (as Lee) to the situations provided in the following pages (0-10 tickets based upon completeness, insightfulness, how well you deal with other organizational members, etc.)
2. Lee's final position with Mototronics at the end of the experiment

Permanent Capital Procurement Manager	5 tickets
Production Manager	2 tickets
No longer employed by Mototronics	0 tickets

3. Lee's performance evaluation

Excellent	10 tickets
Good	6 tickets
Fair	4 tickets
Poor	0 tickets

The analysis of your responses will take place during the remainder of this week. Your subject number will be credited with the lottery tickets you have earned. You personally will be awarded the tickets at the drawing on April 25, at 1 pm in BUS 103 when you present this page (it will not be necessary to be present however, your tickets will be included in the drawing whether you are present or not). You will be eligible to win one of the following seven prizes:

1. \$200
2. \$100
3. \$100
4. \$50
5. \$50
6. \$50
7. \$50

If you have any questions about the procedures of this experiment or the lottery please stop by my office, BUS 249F or call me at 392-1039.

Period 1 Experimental Materials

Inter-office Correspondence

Paging Division

To: Lee Chambers

January 2, 1992

From: Lou Albert, Personnel Manager

Lee, congratulations on your promotion! So that you may have a formal copy of what we discussed about your new position as Capital Procurement Manager, here's a brief discussion of the basic details about your job:

Job Requirements You will oversee the equipment and facility requirements for each pager over its planned product life. At the end of each model's life, you will dispose of or find alternative uses for equipment and manage the acquisition of equipment and facilities for the replacement model. All acquisition decisions which exceed \$50,000 are subject to approval by the Investment Committee of the Board of Directors.

Evaluation Your performance evaluation will be administered by the Paging Division Vice President at the end of each product's life. At this time the goodness of your decisions and the outcomes of your decisions will be evaluated. It will be based upon your overall performance as a manager (cost containment for your investments, relationships with other organizational managers, etc.). Your next performance evaluation is scheduled for the beginning of 1995.

Remuneration As agreed, your annual salary is \$95,000 Paid semi-monthly. Benefits include pension plan and life, health and dental insurance. Promotions are formally considered during your performance evaluations or when openings occur within the corporation. If recommended, promotion will occur within the division or to another division if no openings are available in the Paging Division.

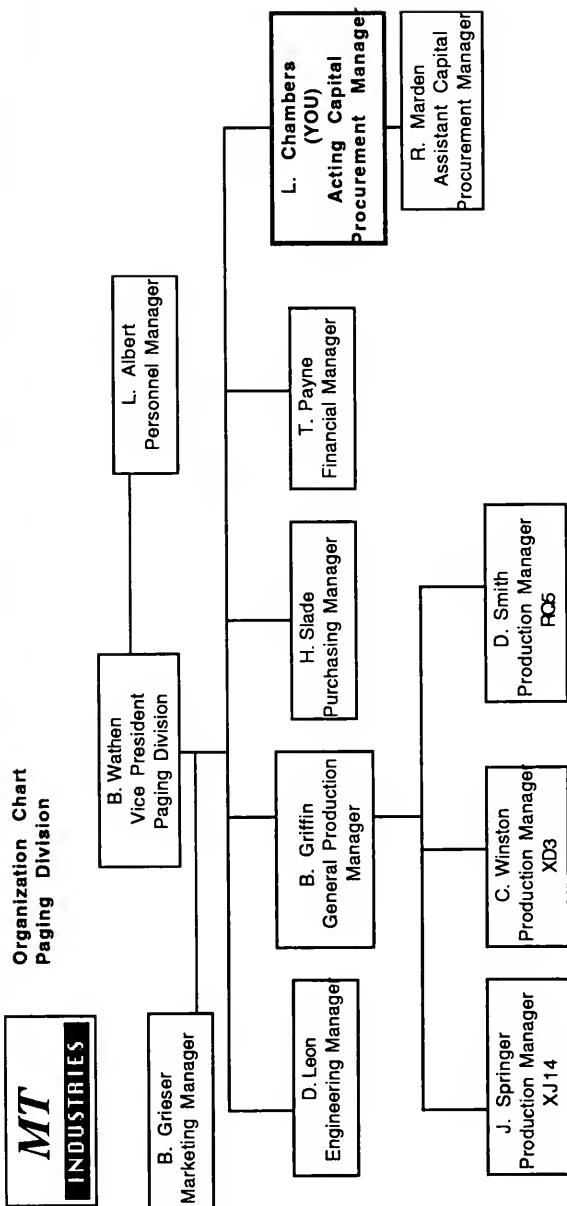


Figure A-1
Mototronics Organizational Chart



Inter-office Correspondence

Paging Division

To: Lee Chambers January 3, 1992

From: Robert Marden, Assistant Production
Investment Manager

Re: Planned Production of Pagers

Following is the planned production schedule for beepers in the Paging Division. As you can see, production is scheduled to begin for XD3 this year. I will provide you with relevant acquisition information at the meeting tomorrow.

<u>Pager</u>	<u>XJ14</u>	<u>XD3</u>	<u>RO5</u>
Production Years	1991-1995	1992-1995	1990-1994
Investment Required as of 1/3/92	none	equipment	none
Future Investment Required for new pager version	1996	1996	1995



Inter-office Correspondence

Paging Division

To: Lee Chambers

January 5, 1992

From: Robert Marden, Assistant Production
Investment Manager

Re: Production of XD3

As we discussed in the meeting yesterday it will be most economical to purchase the paging device's internal parts, preassembled from the Puerto Rico Plant. The transfer price of each unit will be \$48.

Per your request, here is the cost data for the production of the external part, the housing, for XD3. There are two options for production of the housing: Machine 0036 or Machine 0073. At the end of XD3 production either machine will be converted for use in other production lines. The cost of this conversion does not differ between alternatives and therefore is not considered in this analysis. Based on budgeted annual production of 1,000,000 units of XD3 the relevant information (which includes planned raises and probable price increases) follows:

Option 1 is Machine 0036:

The housing could be produced by the highly automated American (Arizona)-produced system using Machine 0036.

<u>Costs</u>		
Year 1	Initial Investment	\$70,000 (includes
	installation)	
	Labor	2,000
	Materials	12,000
	Maintenance	15,000
Year 2	Labor	2,200
	Materials	13,200
	Maintenance	16,500
Year 3	Labor	2,400
	Materials	14,000
	Maintenance	17,000

The present value of these costs is:

	<u>Cost</u>	<u>Present Value</u>
Year 1	99,000	99,000
Year 2	31,900	28,487
Year 3	33,400	26,620
		154,107

Option 2 is Machine 0073:

Or, on the other hand the housing could be produced by the highly automated American (New York)-produced system using machine 0073.

<u>Costs</u>		
Year 1	Initial Investment	\$65,000 (includes
	installation)	
	Labor	2,000
	Materials	13,000
	Maintenance	16,000
Year 2	Labor	2,200
	Materials	14,300
	Maintenance	17,600
Year 3	Labor	2,400
	Materials	15,000
	Maintenance	18,000

The present value of these costs is:

	<u>Cost</u>	<u>Present Value</u>
Year 1	96,000	96,000
Year 2	34,100	30,451
Year 3	35,400	28,214
		154,665

As you can see the cost of the two options have similar present values, but they are produced in different cities. There are no major differences between the companies that would cause me to recommend one over the other. Both options should provide the same basic quality of housings.

Lee, which machine would you like to go with? I will forward your recommendation to Mr. Wathen who will present it to the Board of Directors. Would you mind letting me know your reasoning so that I can use this information to provide better information for you in the future?

Period 2 Experimental Materials

Inter-office Correspondence

Paging Division

To: Lee Chambers January 2, 1993

From: Bob Wathen, Vice President

Re: BOD Reaction to Acquisition Recommendations

Thank you for your recommendation concerning the acquisition of equipment for the production of XD3's housing. The Board of Directors acted on your recommendation (as you are aware since production began in 1992) at their annual meeting in January last year. Having attended the meeting, I can tell you firsthand that several Board members were very dissatisfied and critical of your recommendation and were firmly prepared to vote against it. Although they were highly skeptical and critical of your recommendation and were firmly convinced you had recommended the wrong course of action, in the final analysis, the Board reluctantly deferred to your judgment. (Lee, I really have to point out that I believe the Board finally agreed to support your recommendation because I went out on a limb for you and defended your decision, not because they were pleased.)

The Board would like to have more information about the reasons behind your recommendation. In order that the Board might be better informed, please justify your recommendation to purchase machine 0036 below so that I can distribute it to the Board members before this January's annual meeting.



Inter-office Correspondence

Paging Division

To: Lee Chambers December 31, 1992¹

From: Ted Payne, Financial Manager

Re: Production Cost Report

Lee, here are the 1992 production results for pagers currently in production (XJ14, XD3 and RQ5). The report includes the actual, planned and variance for the number of units produced, the transfer prices paid and the manufacturing costs.

	Actual	Planned	Variance
<u>XJ14:</u>			
<u>Volume</u> (in units)	1,498,000	1,500,000	(2,000)*
<u>Transfer Price</u> <u>Internal Parts(\$)</u>	45	45	0
<u>Housing Production (\$)</u>			
Labor	3,850	4,000	(150)*
Materials	12,000	13,000	(1,000)*
Maintenance	15,300	15,000	300*
<u>XD3:</u>			
<u>Volume</u> (in units)	1,003,000	1,000,000	3000*
<u>Transfer Price</u> <u>Internal Parts(\$)</u>	48	48	0
<u>Housing Production (\$)</u>			
Labor	2,060	2,000	60*
Materials	12,100	12,000	100*
Maintenance	14,800	15,000	(200)*

¹Although this memo is dated December 31, 1992, the subjects received it after the memo dated January 2. This timing was designed to reflect normal delays in receiving corporate reports.

RQ5:

<u>Volume</u> (in units)	2,001,000	2,000,000	1000*
<u>Pager Production (\$)</u>			
Labor	4,560	4,000	560*
Materials	52,900	50,000	2900*
Maintenance	30,800	30,000	800*

*These variances are considered immaterial, especially in light of the volume variances.
Further investigation is deemed unwarranted.



Inter-office Correspondence

Paging Division

To: Lee Chambers

January 6, 1993

From: Robert Marden, Assistant Capital
Procurement Manager

Re: XD3 Production

I have come across some private information from a colleague of mine who also recently graduated from MIT, which probably won't hit the press for another couple of years. He works for a well-established American company out of Arizona which has developed a robot, ZR15, which can be used in conjunction with machine 0073 (the machine we rejected for the production of the XD3 housing). ZR15 effectively cuts materials, maintenance and labor costs by 75%! It really is an exciting breakthrough, but because of red tape, etc. it will not be available to the general public for a number of years. Through my friend, though, we have an option to purchase ZR15 now. It will be possible to convert machine 0036 to 0073. I have outlined the relevant information for the two options below. As always Lee, this information is confidential and just between us.

Option 1 is Machine 0036:

You could keep the machine:

Costs

Year 2	Labor	2,200
	Materials	13,200
	Maintenance	16,500
Year 3	Labor	2,400
	Materials	14,000
	Maintenance	17,000

The present value of these costs is:

Cost Present Value

Year 2	31,900	31,900
Year 3	33,400	<u>29,827</u>
		61,727

Option 2 is Machine 0073:

On the other hand the engineering department could convert the machine and purchase ZR15 at a cost of \$20,000. This amount includes the purchase of ZR15 and all of the costs of conversion such as overtime labor costs and hiring and training expenses for new employees. Unfortunately, this would require a stop in the production line while they rebuild the machine. However, it will be possible to remove the old parts and install the new in one weekend so that there should be little downtime. Therefore, other than the inconvenience, by going into overtime production, it would be possible to make up for the missed production when the machine restarts. All relevant costs of this conversion are included below.

Costs

Year 2	Conversion	20,000
	Labor	550
	Materials	3,575
	Maintenance	4,400
Year 3	Labor	600
	Materials	3,750
	Maintenance	4,500

The present value of these costs is:

	Cost	Present Value
Year 2	28,525	28,525
Year 3	8,850	<u>7.903</u> 36,428

You now have some of the information necessary to make a decision as to which machine you would like to use for future production of XD3. Recall the following:

1. The availability of ZR15 is known only to you and Robert and will not become publicly available for a number of years.
2. The Board of Directors was unhappy with your choice of 0036 and probably agreed to go along with it only because Mr. Wathen defended your choice.
3. Your position as Capital Procurement Manager is temporary, if you do not perform well you will not keep the position.
4. Converting to 0073 by purchasing ZR15 would decrease costs by 75%.
5. The recession is worsening and unemployment is increasing.
6. 0036 performed at budget.
7. Your performance evaluation will be conducted at the end of each beeper's product life at which time the goodness of your decisions and the outcomes of your decisions will be evaluated. You will not receive your next performance evaluation until the beginning of 1995.

Please indicate which machine you wish to choose: _____

Now that you have made the decision, please write all of the specific benefits you considered for both choices, when making your decision. In other words, as a result of each choice, what positive things do you think would happen to you personally or to Mototronics? (Please list the possible positive results of choosing each option and BE VERY SPECIFIC). Some people consider benefits which affect them personally, some consider those which affect Mototronics and some consider both. There are no right or wrong answers, I am mainly interested in what you were thinking when you made your decision. Please complete all four lists:

Specific benefits for me personally if I remained with 0036:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Specific benefits for Mototronics if I remained with 0036:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Lists continue on the next page....

Specific benefits for me personally if I changed to 0073:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Specific benefits for Mototronics if I changed to 0073:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

100

Note, there is a line provided to the right of each benefit that you listed. Please follow the following steps in order to show me how important each benefit was in making your decision, relative to all of the benefits you listed.

1. Start with a total of 100 points to be allocated to all four lists (i.e., the points allocated to all four lists should add up to 100).
2. Allocate the 100 points among all of the benefits you listed. The points you assign should represent the extent to which you actually considered the benefits in making your choice.
3. Make sure that the points you assign to all four lists add up to 100. In other words, add up all the points you allocated to all four lists on both pages...the total should be 100.

Now, without looking back at the previous list (It is very important that you do not look back. The two lists do not have to be identical), please consider the following lists of consequences. Listed are a number of factors that people might consider when trying to decide whether to remain with 0036 or to change to 0073. Rate the extent to which you considered each of the following benefits by circling the number which indicates how important it was in your decision.

- 1 = not at all important
- 2 = slightly important
- 3 = somewhat important
- 4 = very important
- 5 = extremely important

Once again, there are no right or wrong answers, I am mainly interested in what you were thinking when you made your decision.

Specific benefits if I remained with 0036:

	extremely important	very important	somewhat important	slightly important	not at all important
1. Mototronics would avoid the risk of incurring unexpected costs, unexpected production problems, etc.	1	2	3	4	5
2. I would appear to have confidence in my decisions and to be standing up for what I believe in.	1	2	3	4	5
3. Mototronics would not have to retrain any workers.	1	2	3	4	5
4. I would not have to admit to the Board of Directors or my boss that my original choice was not the best, that I had made a "mistake."	1	2	3	4	5
5. I would not look like I couldn't make up my mind or that I was uncertain of my decisions.	1	2	3	4	5
6. I would receive acceptable performance evaluations and might become permanent Capital Procurement Manager.	1	2	3	4	5
7. Mototronics would not have to stop production.	1	2	3	4	5
8. Mototronics would continue to produce XD3 at or under budget.	1	2	3	4	5
9. Mototronics would have no conversion costs.	1	2	3	4	5
10. Mototronics would not have an unbudgeted, extra cash outlay for the conversion in year two.	1	2	3	4	5
11. I would avoid possible questions about my ethics for acting on "private" information.	1	2	3	4	5
12. I would avoid receiving an unacceptable performance evaluation and possible demotion.	1	2	3	4	5
13. Mototronics would not have to lay off any workers.	1	2	3	4	5
14. I would appear to know what I was doing and as competent in my original decision process.	1	2	3	4	5

Specific benefits if I changed to 0073:

	not at all important	slightly important	somewhat important	very important	extremely important
1. Mototronics' would save a lot of money and have higher profit.	1	2	3	4	5
2. Mototronics would produce XD3 significantly below budget.	1	2	3	4	5
3. Mototronics would get a jump on advanced technology, it would be on the "cutting edge."	1	2	3	4	5
4. I would please the Board of Directors since they were resistant to my original choice.	1	2	3	4	5
5. I would receive a better performance evaluation and might become permanent Capital Procurement Manager.	1	2	3	4	5
6. I would be perceived as having the confidence and flexibility to adapt to new information and to change to a better option.	1	2	3	4	5
7. Mototronics might be able to use the cost savings for other profitable ventures.	1	2	3	4	5
8. I would look like a genius if it panned out and would be considered a hero.	1	2	3	4	5
9. Mototronics would get a jump on competitors with the new production techniques.	1	2	3	4	5
10. I would appear to be doing the best thing for the company, and to be willing to put the company ahead of myself.	1	2	3	4	5
11. My reputation would not be harmed if the savings weren't recognized, because the beepers would still be produced efficiently.	1	2	3	4	5
12. Mototronics would decrease overall cash outflows.	1	2	3	4	5
13. Mototronics would improve its ability to attract outside investors due to the advanced technology and higher profits.	1	2	3	4	5
14. I would please the Production Managers due to the decreased costs.	1	2	3	4	5

Period 3 Experimental Materials

Inter-office Correspondence

Paging Division

To: Lee Chambers December 31, 1993

From: Ted Payne, Financial Manager

Re: Production Cost Report

Lee, here are the 1993 production results for pagers currently in production (XJ14, XD3 and RQ5). The report includes the actual, planned and variance for the number of units produced, the transfer prices paid and the manufacturing costs.

	Actual	Planned	Variance
--	--------	---------	----------

XJ14:

<u>Volume</u> (in units)	1,499,000	1,500,000	(1,000)*
Transfer Price <u>Internal Parts(\$)</u>	45	45	0
<u>Housing Production (\$)</u>			
Labor	4,200	4,400	(200)*
Materials	13,500	14,300	(800)*
Maintenance	16,400	16,500	(100)*

XD3:

<u>Volume</u> (in units)	1,001,500	1,000,000	1500*
Transfer Price <u>Internal Parts(\$)</u>	48	48	0
<u>Housing Production (\$)</u>			
Labor	2,250	2,200	50*
Materials	13,725	13,200	525*
Maintenance	16,000	16,500	(500)*

RQ5:

<u>Volume</u> (in units)	2,000,500	2,000,000	500*
<u>Pager Production (\$)</u>			
Labor	4,550	4,300	250*
Materials	58,950	57,500	1450*
Maintenance	34,800	34,400	400*

*These variances are considered immaterial, especially in light of the volume variances.
Further investigation is deemed unwarranted.

MT**INDUSTRIES**

Inter-office Correspondence

Paging Division

To: Lee Chambers
From: Robert Marden, Assistant Capital
Procurement Manager
Re: XD3 Production

January 6, 1994

Just a reminder Lee, we still have the option to convert machine 0036 to 0073 and to use ZR15. Here is the relevant information for the last year of production. As always, this information is confidential.

Option 1 is Machine 0036:

You could keep the machine:

Year 3	Labor	2,400
	Materials	14,000
	Maintenance	<u>17,000</u>
		33,400

Option 2 is Machine 0073:

On the other hand the engineering department could convert the machine and purchase ZR15 at a cost of \$10,000. This amount includes the purchase of ZR15 and all of the costs of conversion such as overtime labor costs and hiring and training expenses for new employees. Unfortunately, this would require a stop in the production line while they rebuild the machine. However, it will be possible to remove the old parts and install the new in one weekend so that there should be little downtime. Therefore, other than the inconvenience, by going into overtime production, it would be possible to make up for the missed production when the machine restarts. All relevant costs of this conversion are included below.

Year 3	Conversion	10,000
	Labor	600
	Materials	3,750
	Maintenance	<u>4,500</u>
		18,850

Please indicate which machine you wish to choose: _____

Period 4 Experimental Materials

Inter-office Correspondence

Paging Division

To: Lee Chambers

January 10, 1995

From: Bob Wathen, Vice President

Re: XD3 Performance Evaluation

Lee, here is your XD3 Performance Evaluation. I have based this evaluation upon the fact that your investment's costs did not exceed budget and upon your overall performance.

PERFORMANCE EVALUATION:

Excellent	_____
Good	_____ <input checked="" type="checkbox"/>
Fair	_____
Poor	_____

Post-experimental Questionnaire

INSTRUCTIONS: Please answer the following questions. Your responses to these questions will not affect the number of tickets that you earn in this study.

Please circle one of the following for each question:

Strongly Agree	SA
Agree	A
Neutral	N
Disagree	D
Strongly Disagree	SD

1. I felt pressure to "stick with" my original decision.

SA	A	N	D	SD
----	---	---	---	----

2. I felt secure in my job as Capital Procurement Manager.

SA	A	N	D	SD
----	---	---	---	----

3. The Board of Directors was supportive of my recommendations.

SA	A	N	D	SD
----	---	---	---	----

4. I cared what "grade" I was to receive on my performance evaluation.

SA	A	N	D	SD
----	---	---	---	----

5. Poor outcomes from my recommendations clearly would have meant losing the job of Acting Capital Procurement Manager.

SA	A	N	D	SD
----	---	---	---	----

6. There was much resistance to my recommendations.

SA	A	N	D	SD
----	---	---	---	----

7. I needed to protect my position as Acting Capital Procurement Manager in the company.

SA	A	N	D	SD
----	---	---	---	----

8. The Board of Directors was reluctant to accept my recommendations.

SA	A	N	D	SD
----	---	---	---	----

9. During the experiment I acted as *I* thought best, not as I thought "Lee" or other managers might act.

SA	A	N	D	SD
----	---	---	---	----

10. I wanted to perform well and make the best decisions I possibly could in this experiment.

SA	A	N	D	SD
----	---	---	---	----

11. My performance as Acting Capital Procurement Manager was evaluated annually.

SA	A	N	D	SD
----	---	---	---	----

12. I looked back at my original list of consequences even though the instructions asked me not to do so (Please answer honestly, there is no penalty or reward for any answer).

SA	A	N	D	SD
----	---	---	---	----

13. I found the format of the experiment (e.g., using the envelopes) understandable.

SA	A	N	D	SD
----	---	---	---	----

14. In general, when I do a job, I am more concerned about doing the job "right" than with how it will affect me, my bank account, my family, etc.

SA	A	N	D	SD
----	---	---	---	----

15. I wanted to earn lottery tickets.

SA	A	N	D	SD
----	---	---	---	----

16. I believed that the better my decisions, the more lottery tickets I would earn.

SA	A	N	D	SD
----	---	---	---	----

Please answer the following:

17. During this experiment I was trying to accomplish:

18. I am _____ Male

Female

19. My GPA is _____ (you may estimate if you're not sure)

20. My age is

18-22
23-27
28-32
Over 32

21. My major is

Accounting
Economics
Finance
Management
Marketing

22. Have you ever held a full-time job (other than a summer job)?

Yes

No

23. How many tickets do you expect to earn for:

Overall Performance
Performance Evaluation
Ending Position

Please write any comments as to problems you had with this experiment:

Aggression Questionnaire

Please read the following statements: Each one describes a situation and a response. Try to imagine a situation in your life that is as close to the one described as possible, then rate the response according to its similarity with what you might do in the actual situation.

- 1 = Just like me
- 2 = Sometimes like me
- 3 = Not usually like me
- 4 = Not at all like me

- 1. After waiting in a restaurant for 20 minutes, you loudly tell the host of your dissatisfaction and leave.
- 2. Your parents have been after you to spend more time with them. You tell them to stop nagging you.
- 3. A person cuts in front of you in line, so you push him/her/her out of line.
- 4. You are delayed getting home because you stayed at a friend's too long. When your parent/spouse is angry, you tell him/her it's none of his/her business.
- 5. You are driving to an appointment with a friend and she/he has a flat tire. While she/he is changing the tire, you tell her/him how dumb it was to let the tires get worn.
- 6. You accept your boss's opinion about your lack of ability to handle responsibility, but later complain to some friends about his/her unfairness.
- 7. A friend of yours is arguing with someone much larger than she/he is. You decide to help your friend by saying, "I'm really tired of listening to you (the person arguing with your friend) mouth off."
- 8. A person cuts in front of you in line, so you say, "Who do you think you are? Get out of my way."
- 9. You are talking to a friend and she/he doesn't appear to be listening. You tell her/him that you are sick and tired of her/him not listening to you.
- 10. You have arranged to meet a friend, but she/he doesn't arrive. At the first opportunity, you call her/him and demand an explanation.

Note: Questionnaire reprinted with permission of Behavioral Assessment.

General Self-efficacy Questionnaire

This questionnaire is a series of statements about your personal attitudes and traits. Each statement represents a commonly held belief. Read each statement and decide to what extent it describes you. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the letter that best describes your attitude or feeling. Please be very truthful and describe yourself as you really are, not as you would like to be.

A = Disagree strongly
B = Disagree moderately
C = Neither agree nor disagree
D = Agree moderately
E = Agree strongly

- 1. I like to grow house plants.
- 2. When I make plans, I am certain I can make them work.
- 3. One of my problems is that I cannot get down to work when I should.
- 4. If I can't do a job the first time, I keep trying until I can.
- 5. Heredity plays the major role in determining one's personality.
- 6. When I set important goals for myself, I rarely achieve them.
- 7. I give up on things before completing them.
- 8. I like to cook.
- 9. I avoid facing difficulties.
- 10. If something looks too complicated, I will not even bother to try it.
- 11. There is some good in everybody.
- 12. When I have something unpleasant to do, I stick to it until I finish it.
- 13. When I decide to do something, I go right to work on it.
- 14. I like science.
- 15. When trying to learn something new, I soon give up if I am not initially successful.
- 16. When unexpected problems occur, I don't handle them well.
- 17. If I were an artist, I would like to draw children.
- 18. I avoid trying to learn new things when they look too difficult for me.
- 19. Failure just makes me try harder.

- 20. I very much like to ride horses.
- 21. I feel very insecure about my ability to do things.
- 22. I am a self-reliant person.
- 23. I give up easily.
- 24. I do not seem capable of dealing with most problems that come up in my life.

Note: Questionnaire reprinted with permission of M. Scherer.

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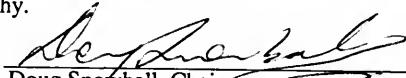
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


Doug Snowball, Chairman
Professor of Accounting

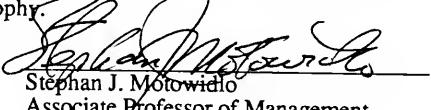
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